

## Chapter 12. Aromatic ketones containing at least one acetyl group and one other acyl group

### 12.1. Acyl groups located on one ring

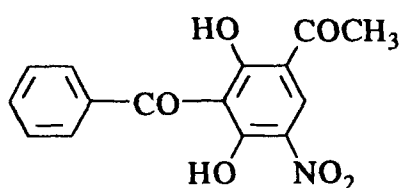
#### 12.1.1. Diphenyl ketone derivatives

##### 1-(3-Benzoyl-2,4-dihydroxy-5-nitrophenyl)ethanone

[54917-81-6]

C<sub>15</sub>H<sub>11</sub>NO<sub>6</sub>

mol.wt. 301.26



#### Synthesis

-Obtained by heating 3-benzoyl-2,4-dihydroxy-acetophenone-4-β-D-glucopyranoside with dilute nitric acid for 3 min (44%) [1232].

**N.B.:** A sesquihydrate was obtained by crystallisation of the ketone in water [1232]. The melting point is determined after water elimination (100°/0.04 mm/1h).

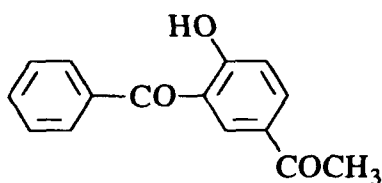
m.p. 114-118° [1232].

##### 1-(3-Benzoyl-4-hydroxyphenyl)ethanone

[13043-37-3]

C<sub>15</sub>H<sub>12</sub>O<sub>3</sub>

mol.wt. 240.26



#### Synthesis

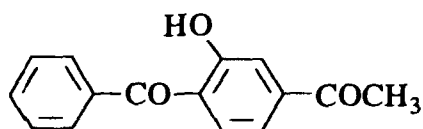
-Refer to: [968] [1055].

##### 1-(4-Benzoyl-3-hydroxyphenyl)ethanone

[39954-75-1]

C<sub>15</sub>H<sub>12</sub>O<sub>3</sub>

mol.wt. 240.26



#### Synthesis

-Obtained by alkaline hydrolysis of 3-(benzoyloxy)-4-benzoylacetophenone (SM) (m.p. 88°) with sodium hydroxide in boiling ethanol for 15 min. SM was prepared by oxidation of 6-acetyl-2,3-diphenylbenzofuran (m.p. 119°) with chromium trioxide in acetic acid at 70-75° for 2 h [87].

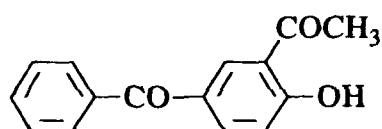
m.p. 103° [87]; IR [87].

##### 1-(5-Benzoyl-2-hydroxyphenyl)ethanone

[2589-80-2]

C<sub>15</sub>H<sub>12</sub>O<sub>3</sub>

mol.wt. 240.26



#### Syntheses

-Obtained by Fries rearrangement of 4-(acetyloxy)-benzophenone with aluminium chloride (3.3 mol) at 150-160° for 1 h [178].

-Also obtained by hydrolysis of 3-acetyl-4-(acetyloxy)-benzophenone [543].  
 -Also refer to: [968].

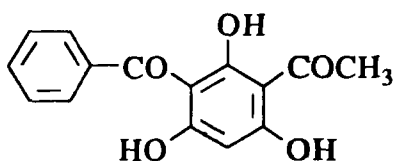
m.p. 102-103° [178], 95-96° [543]; <sup>1</sup>H NMR [543], IR [543], MS [543].

**1-(3-Benzoyl-2,4,6-trihydroxyphenyl)ethanone**

[31188-65-5]

C<sub>15</sub>H<sub>12</sub>O<sub>5</sub>

mol.wt. 272.26



**Syntheses**

-Preparation by C-acetylation of 2-benzoylphloroglucinol with boron trifluoride-acetic acid complex (76%) [1109].  
 -Also refer to: [968] [1423].

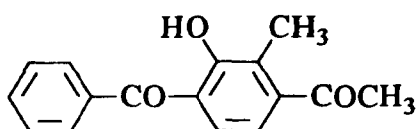
m.p. 145-146° [1109].

**1-(4-Benzoyl-3-hydroxy-2-methylphenyl)ethanone**

[51846-39-0]

C<sub>16</sub>H<sub>14</sub>O<sub>3</sub>

mol.wt. 254.29



**Synthesis**

-Obtained by alkaline hydrolysis of 4-benzoyl-3-benzoyloxy-2-methylacetophenone (m.p. 102°) [1529].

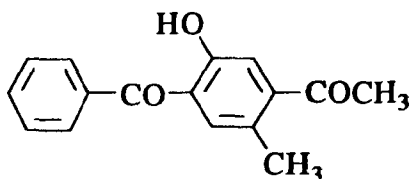
m.p. 39° [1529]; IR [1529].

**1-(4-Benzoyl-5-hydroxy-2-methylphenyl)ethanone**

[39954-81-9]

C<sub>16</sub>H<sub>14</sub>O<sub>3</sub>

mol.wt. 254.29



**Synthesis**

-Obtained by alkaline hydrolysis of 3-(benzoyloxy)-4-benzoyl-6-methylacetophenone (m.p. 135°) (SM) with sodium hydroxide in boiling ethanol for 15 min. SM was obtained by oxidation of 6-acetyl-5-methyl-2,3-diphenylbenzofuran (m.p. 133°) with chromium trioxide in acetic acid at 70-75° for 2 h [87].

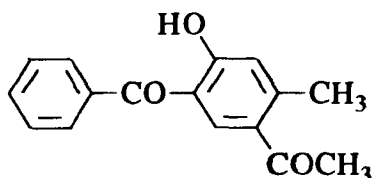
m.p. 92° [87]; IR [87].

**1-(5-Benzoyl-4-hydroxy-2-methylphenyl)ethanone**

[51846-51-6]

C<sub>16</sub>H<sub>14</sub>O<sub>3</sub>

mol.wt. 254.29



**Synthesis**

-Obtained by alkaline hydrolysis of 5-benzoyl-4-benzoyloxy-2-methylacetophenone [1529].

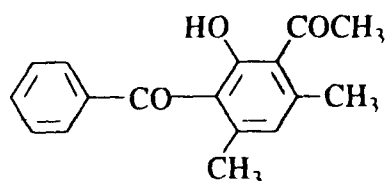
m.p. 108-112° [1529]; IR [1529]

**1-(3-Benzoyl-2-hydroxy-4,6-dimethylphenyl)ethanone**

[84312-32-3]

C<sub>17</sub>H<sub>16</sub>O<sub>3</sub>

mol.wt. 268.31



**Synthesis**

-Obtained by UV light irradiation of 2-acetyl-3,5-dimethylphenyl benzoate in benzene for 10 h (13%) [545].

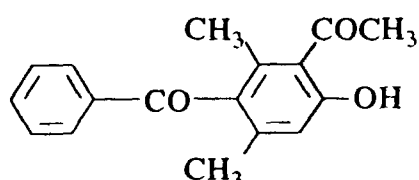
m.p. 138-139° [545]; <sup>1</sup>H NMR [545], IR [545], UV [545], MS [545].

**1-(3-Benzoyl-6-hydroxy-2,4-dimethylphenyl)ethanone**

[84312-33-4]

C<sub>17</sub>H<sub>16</sub>O<sub>3</sub>

mol.wt. 268.31



**Synthesis**

-Obtained by UV light irradiation of 2-acetyl-3,5-dimethylphenyl benzoate in benzene for 10 h (6%) [545].

m.p. 61-65° [545];

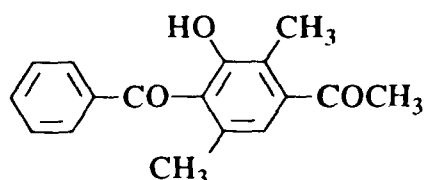
<sup>1</sup>H NMR [545], IR [545], UV [545], MS [545].

**1-(4-Benzoyl-3-hydroxy-2,5-dimethylphenyl)ethanone**

[51846-44-7]

C<sub>17</sub>H<sub>16</sub>O<sub>3</sub>

mol.wt. 268.31



**Synthesis**

-Obtained by alkaline hydrolysis of 4-benzoyl-3-benzoyloxy-2,5-dimethylacetophenone (m.p. 145-146°) [1529].

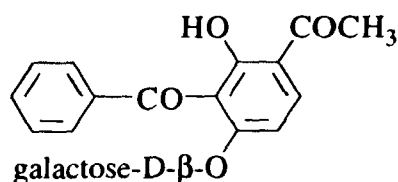
m.p. 95-102° [1529].

**1-[3-Benzoyl-4-(β-D-galactopyranosyloxy)-2-hydroxyphenyl]ethanone**

[54917-83-8]

C<sub>21</sub>H<sub>22</sub>O<sub>9</sub>

mol.wt. 418.40



**Synthesis**

-Obtained by action of 4-formyl-1,2-phenylene dibenzoate with 2-hydroxy-4-(β-D-galactopyranosyloxy)acetophenone in acetone in the presence of 2 N aqueous sodium hydroxide at 20° (16%) [1232].

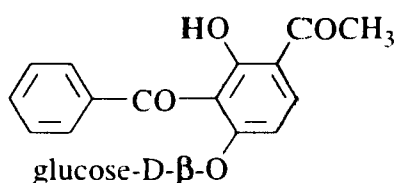
m.p. 199-201° [1232]; (α)<sub>D</sub><sup>18</sup> = +78° (c = 0.4 in pyridine) [1232].

**1-[3-Benzoyl-4-( $\beta$ -D-glucopyranosyloxy)-2-hydroxyphenyl]ethanone**

[54918-25-1]

 $C_{21}H_{22}O_9$ 

mol.wt. 418.40

**Synthesis**

-Obtained by reaction of 4-formyl-1,2-phenylene dibenzoate with 2-hydroxy-4-( $\beta$ -D-glucopyranosyloxy)-acetophenone in acetone in the presence of 2 N aqueous sodium hydroxide at 20° for 17 h (29%) [1232].

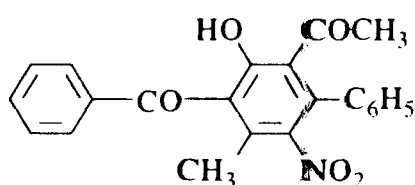
m.p. 192-194° [1232];  $(\alpha)_D^{25} = -89^\circ$  ( $c = 0.55$  in acetone/water 1:1) [1232].

**1-(4-Benzoyl-3-hydroxy-5-methyl-6-nitro[1,1'-biphenyl]-2-yl)ethanone**

[85450-70-0]

 $C_{22}H_{17}NO_5$ 

mol.wt. 375.38

**Synthesis**

-Obtained (by-product) by reaction of 1,3-dibenzoyl-4,6-dimethylpyrone with nitromethane in tert-butanol in the presence of potassium tert-butoxide at 60° for 4 h (13%) [447].

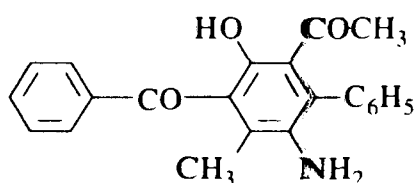
m.p. 141-142° [447].

**1-(6-Amino-4-benzoyl-3-hydroxy-5-methyl[1,1'-biphenyl]-2-yl)ethanone**

[85450-81-3]

 $C_{22}H_{19}NO_3$ 

mol.wt. 345.40

**Synthesis**

-Obtained (poor yield) by catalytic hydrogenation of 3-acetyl-2-hydroxy-6-methyl-5-nitro-4-phenyl-benzophenone in ethanol in the presence of 10% Pd/C at 40° for 3 days (9%) [447].

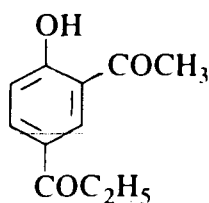
m.p. 120-123° [447].

**12.1.2. Miscellaneous****1-(3-Acetyl-4-hydroxyphenyl)-1-propanone**

[79010-36-9]

 $C_{11}H_{12}O_3$ 

mol.wt. 192.21

**Synthesis**

-Preparation by Fries rearrangement of 4-propionylphenyl acetate with aluminium chloride at 150° for 3 h (80%) [1280].

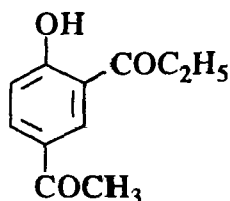
m.p. 69° [1280];  $^1H$  NMR [1280], IR [1280].

**1-(5-Acetyl-2-hydroxyphenyl)-1-propanone**

[36039-26-6]

C<sub>11</sub>H<sub>12</sub>O<sub>3</sub>

mol.wt. 192.20



**Syntheses**

-Preparation by Fries rearrangement of p-(propionyloxy)-acetophenone with aluminium chloride (4 mol) without solvent at 150° for 3 h (62%) [633].

-Also obtained by Friedel-Crafts acylation of p-hydroxyacetophenone with propionyl chloride in the presence of aluminium chloride (4 mol) in tetrachloroethane at 130° for 4 h (47%) [633].

-Also obtained by deacylation of 2-(LD-2'-acetoxypropionyloxy)-5-acetylpropiophenone (24%) [632].

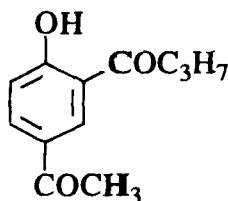
m.p. 67-69° [633]; <sup>1</sup>H NMR [633], IR [633].

**1-(5-Acetyl-2-hydroxyphenyl)-1-butanone**

[92757-66-9]

C<sub>12</sub>H<sub>14</sub>O<sub>3</sub>

mol.wt. 206.24



**Syntheses**

-Preparation by Fries rearrangement of p-(butyryloxy)-acetophenone with aluminium chloride (4 mol) without solvent at 150° for 3 h (58%) [633].

-Also obtained by Friedel-Crafts acylation of p-hydroxyacetophenone with butyryl chloride in the presence of aluminium chloride (4 mol) in tetrachloroethane at 130° for 4 h (47%) [633].

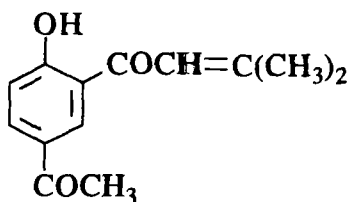
m.p. 54-55° [633]; <sup>1</sup>H NMR [633], IR [633].

**1-(5-Acetyl-2-hydroxyphenyl)-3-methyl-2-buten-1-one**

[65580-31-6]

C<sub>13</sub>H<sub>14</sub>O<sub>3</sub>

mol.wt. 218.25



**Isolation from natural sources**

-From the aerial parts of *Ophryosporus floribundus* (Compositae, tribe Eupatorieae) [1570].

-From the leaves of *ageratina altissima* (L) K. et R. (Compositae) [197].

-From the aerial parts of *senecio behnii* Ric. et Martic [427].

-From the aerial parts of *Ophryosporus charua* (Griseb.) Hieron (Compositae) [369].

-From *Ophryosporus chilca* [369].

m.p. 75°5 [197]; TLC [197];

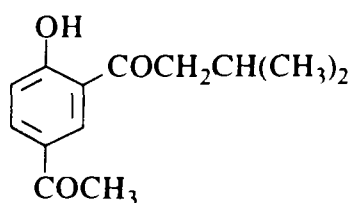
<sup>1</sup>H NMR [197], IR [197], UV [197], MS [197].

**1-(5-Acetyl-2-hydroxyphenyl)-3-methyl-1-butanone**

[62458-64-4]

 $C_{13}H_{16}O_3$ 

mol.wt. 220.27

**Syntheses**

- Preparation by Fries rearrangement of p-acetylphenyl isovalerate without solvent in the presence of aluminium chloride at 140-160° for 2.5 h (51%) [195] or at 150° for 3 h (32%) [633].
- Also obtained by Friedel-Crafts acylation of p-hydroxyacetophenone with isovaleryl chloride (4 mol) in tetrachloroethane at 130° for 4 h (37%) [633].

**Isolation from natural sources**

- From the genus *Flourensia cernua* DC (Compositae) [194].
- From the aerial parts of *Ophryosporus floribundus* (Compositae, tribe Eupatorieae) [1570].
- From sliced yacon tubers after inoculation with the bacterium *Pseudomonas cichorii* and incubation at 20° for three days, then extraction with acetone. Yacon (*Polymnia sonchifolia*) (Compositae) is cultivated in South America and has recently been introduced in Japan [1432].

Colourless oil [194];

m.p. 94°5-96° [1432]; 64-66° [633], 61°5 [195].

One of the reported melting points is obviously wrong.

 $^1H$  NMR [194] [633] [1432],  $^{13}C$  NMR [1432], IR [194] [633] [1432],

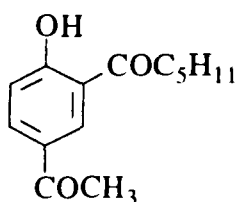
UV [1432], MS [194] [1432].

**1-(5-Acetyl-2-hydroxyphenyl)-1-hexanone**

[92757-67-0]

 $C_{14}H_{18}O_3$ 

mol.wt. 234.30

**Syntheses**

- Obtained by Fries rearrangement of p-(caproyloxy)-acetophenone with aluminium chloride (4 mol) without solvent at 150° for 3 h (37%) [633].
- Also obtained by Friedel-Crafts acylation of p-hydroxyacetophenone with caproyl chloride in the presence of aluminium chloride in tetrachloroethane at 130° for 4 h (39%) [633].

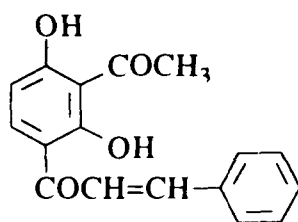
m.p. 52° [633];  $^1H$  NMR [633], IR [633].**1-(3-Acetyl-2,4-dihydroxyphenyl)-3-phenyl-2-propen-1-one**

[116470-07-6]

 $C_{17}H_{14}O_4$ 

mol.wt. 282.30

[84422-44-6] (E)

**Synthesis**

- Obtained by reaction of benzaldehyde with 2,4-diacetylresorcinol in ethanol in the presence of concentrated aqueous potassium hydroxide at r.t. (Claisen-Schmidt condensation), for 48 h (34%) [1023] or for 24 h (9%) [57].

m.p. 149° [57], 134° [1023]; TLC [57] [1023].

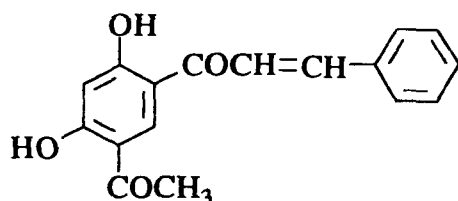
One of the reported melting points is obviously wrong.

<sup>1</sup>H NMR [57] [1023], IR [57], UV [57], MS [57].**1-(5-Acetyl-2,4-dihydroxyphenyl)-3-phenyl-2-propen-1-one (E)**

[104236-84-2]

C<sub>17</sub>H<sub>14</sub>O<sub>4</sub>

mol.wt. 282.30



Synthesis

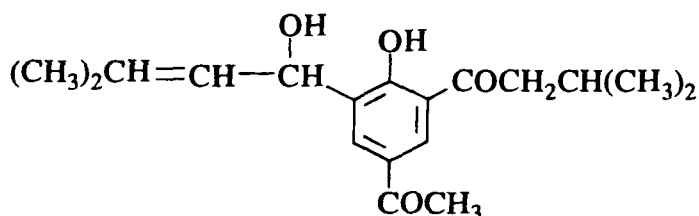
-No details of synthesis are given [1112].

**1-[5-Acetyl-2-hydroxy-3-(1-hydroxy-3-methyl-2-butenyl)phenyl]-3-methyl-1-butanone**

[94413-27-1]

C<sub>17</sub>H<sub>24</sub>O<sub>4</sub>

mol.wt. 292.38



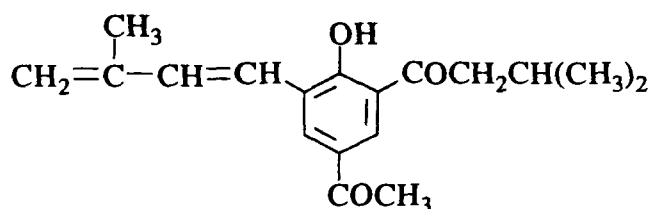
Isolation from natural sources

-From the aerial parts of *Ophryosporus peruvianus* (Gmel.) K. et R. (Compositae) [198].**1-[5-Acetyl-2-hydroxy-3-(3-methyl-1,3-butadienyl)phenyl]-3-methyl-1-butanone (E)**

[148707-32-8]

C<sub>18</sub>H<sub>22</sub>O<sub>3</sub>

mol.wt. 286.37



Synthesis

N.B.: After several days in a CDCl<sub>3</sub> solution used for the <sup>1</sup>H NMR measurements, 3-(3-hydroxy-3-methyl-1-butenyl)-5-isovaleryl-p-hydroxy-acetophenone (E) was converted into

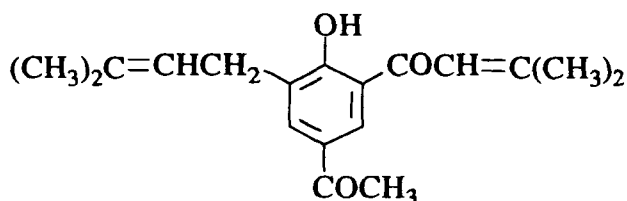
the titled substance [1360].

<sup>1</sup>H NMR [1360].**1-[5-Acetyl-2-hydroxy-3-(3-methyl-2-butenyl)phenyl]-3-methyl-2-buten-1-one (Piloselloidon)**

[94413-26-0]

C<sub>18</sub>H<sub>22</sub>O<sub>3</sub>

mol.wt. 286.37



Isolation from natural sources

-From the roots of *Gerbera piloselloides* Cass. (Compositae, tribe Arctotideae) [193].  
-From the aerial parts of *Ophryosporus chilca* (Compositae, tribe Eupatorieae) [198].

-From the aerial parts of *Ophryosporus peruvianus* (Compositae) [198].

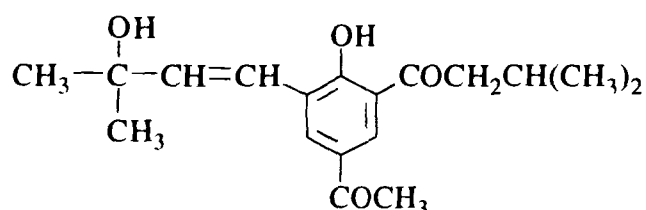
Colourless oil [193]; TLC [198];  $^1\text{H}$  NMR [193], IR [193], MS [193].

**1-[5-Acetyl-2-hydroxy-3-(3-hydroxy-3-methyl-1-butenyl)phenyl]-3-methyl-1-butanone (E)**

[54963-60-9]

$\text{C}_{18}\text{H}_{24}\text{O}_4$

mol.wt. 304.39



Isolation from natural sources

-From the aerial parts of *Ophryosporus charua* (Griseb.) Hieron (Compositae) [369].

-From the aerial parts of *Ophryosporus macrodon* Griseb. (Compositae, tribe Eupatorieae) [1360].

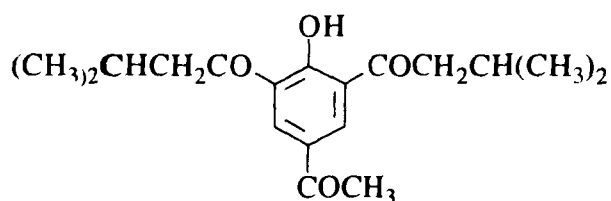
m.p. 103-105° [1360];  $^1\text{H}$  NMR [1360], MS [1360].

**1,1'-(5-Acetyl-2-hydroxy-1,3-phenylene)bis[3-methylbutanone**

[94413-28-2]

$\text{C}_{18}\text{H}_{24}\text{O}_4$

mol.wt. 304.39



Isolation from natural sources

-From the aerial parts of *Ophryosporus peruvianus* (Gmel.) K. et R. (Compositae) [198].

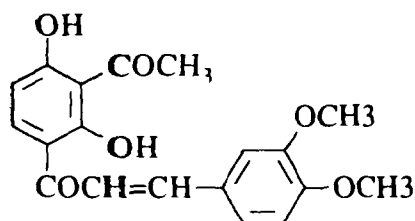
$^1\text{H}$  NMR [198], IR [198], MS [198]; TLC [198].

**1-(3-Acetyl-2,4-dihydroxyphenyl)-3-(3,4-dimethoxyphenyl)-2-propen-1-one**

[116470-11-2]

$\text{C}_{19}\text{H}_{18}\text{O}_6$

mol.wt. 342.35



Synthesis

-Obtained by reaction of veratraldehyde with 2,4-diacetyl-resorcinol in ethanol in the presence of aqueous potassium hydroxide at r.t. for 24 h (18%) [57].

m.p. 189-190° [57]; TLC [57];

$^1\text{H}$  NMR [57], IR [57], UV [57], MS [57].

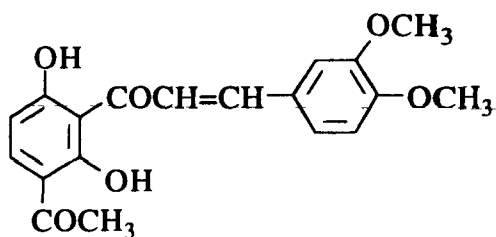


**1-(3-Acetyl-2,6-dihydroxyphenyl)-3-(3,4-dimethoxyphenyl)-2-propen-1-one**

[116470-10-1]

C<sub>19</sub>H<sub>18</sub>O<sub>6</sub>

mol.wt. 342.35



**Synthesis**

-Obtained (by-product) by reaction of veratraldehyde with 2,4-diacetylresorcinol in ethanol in the presence of aqueous potassium hydroxide at r.t. for 24 h (6%) [57].

m.p. 164° [57]; TLC [57]; <sup>1</sup>H NMR [57], IR [57], UV [57], MS [57].

**12.2. Acyl groups located on different rings**

**12.2.1. Diphenyl ketone derivatives**

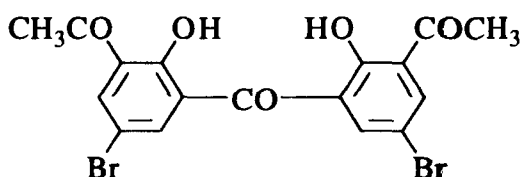
**Symmetrical ketones**

**1,1'-[Carbonylbis(5-bromo-2-hydroxy-3,1-phenylene)]bis-ethanone**

[83143-07-1]

C<sub>17</sub>H<sub>12</sub>Br<sub>2</sub>O<sub>5</sub>

mol.wt. 456.09



**Synthesis**

-Preparation by Fries rearrangement of 2,2'-diacetoxy-5,5'-dibromobenzophenone with aluminium chloride at 160-180° for 20 min (50%) [1040].

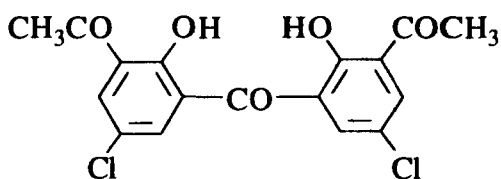
m.p. 230-231° [1040].

**1,1'-[Carbonylbis(5-chloro-2-hydroxy-3,1-phenylene)]bis-ethanone**

[83143-06-0]

C<sub>17</sub>H<sub>12</sub>Cl<sub>2</sub>O<sub>5</sub>

mol.wt. 367.18



**Synthesis**

-Preparation by Fries rearrangement of 2,2'-diacetoxy-5,5'-dichlorobenzophenone with aluminium chloride,

\*at 160-180° for 20 min (80%) [1040];

\*at 170-180° for 30 min (80%) [1041].

m.p. 222-224° [1040] [1041].

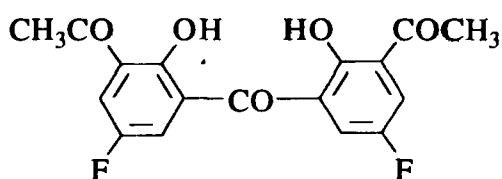
**N.B.:** Na salt, m.p. > 360° [1041].

**1,1'-[Carbonylbis(5-fluoro-2-hydroxy-3,1-phenylene)]bis-ethanone**

[83143-05-9]

C<sub>17</sub>H<sub>12</sub>F<sub>2</sub>O<sub>5</sub>

mol.wt. 334.28



**Synthesis**

-Preparation by Fries rearrangement of 2,2'-diacetoxy-5,5'-difluorobenzophenone with aluminium chloride at 160-180° for 20 min (72%) [1040].

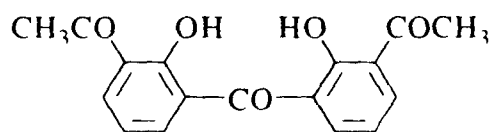
m.p. 149-150° [1040].

**1,1'-[Carbonylbis(2-hydroxy-3,1-phenylene)]bis-ethanone**

[83143-08-2]

C<sub>17</sub>H<sub>14</sub>O<sub>5</sub>

mol.wt. 298.30



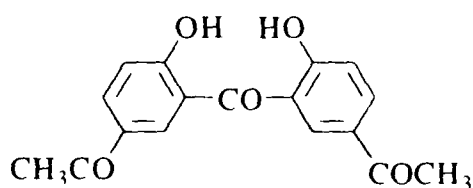
m.p. 170-171° [1040].

**Synthesis**

-Preparation by Fries rearrangement of 2,2'-diacetoxybenzophenone with aluminium chloride at 160-180° for 20 min (63%) [1040].

**1,1'-[Carbonylbis(4-hydroxy-3,1-phenylene)]bis-ethanone**C<sub>17</sub>H<sub>14</sub>O<sub>5</sub>

mol.wt. 298.30

**Synthesis**

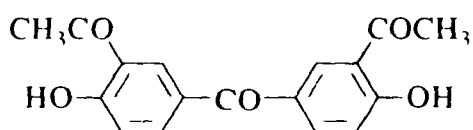
-Obtained (by-product) by Fries rearrangement of 2,2'-diacetoxybenzophenone with aluminium chloride at 160-180° for 20 min (10%) [1040].

**1,1'-[Carbonylbis(6-hydroxy-3,1-phenylene)]bis-ethanone**

[20795-69-1]

C<sub>17</sub>H<sub>14</sub>O<sub>5</sub>

mol.wt. 298.30

**Syntheses**

-Obtained by Fries rearrangement of 4,4'-diacetoxybenzophenone, \*with aluminium chloride at 140° for 4 h (40%) [126];

\*with aluminium chloride and sodium chloride at 140-150° for 6 h [260].

-Also obtained by alkaline degradation of 6,6'-bichromonyl ketone (m.p. 249-250°) with refluxing 10% aqueous sodium hydroxide for 20 min [1195].

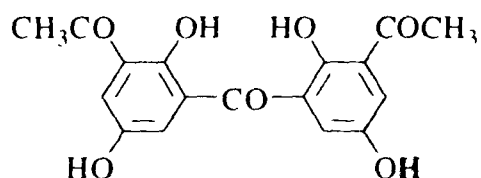
m.p. 182-183° [126], 180-181° [1195], 174-176° [260].

**1,1'-[Carbonylbis(2,5-dihydroxy-3,1-phenylene)]bis-ethanone**

[78563-21-0]

C<sub>17</sub>H<sub>14</sub>O<sub>7</sub>

mol.wt. 330.29

**Synthesis**

-Obtained by Fries rearrangement of 2,2',5,5'-tetraacetoxybenzophenone with aluminium chloride at 175-178° for 20 min (30%) [604].

m.p. &gt; 300° [604].

**N.B.:** This ketone (**5d**) was characterized by its corresponding tetraacetate (**5d<sub>1</sub>**)

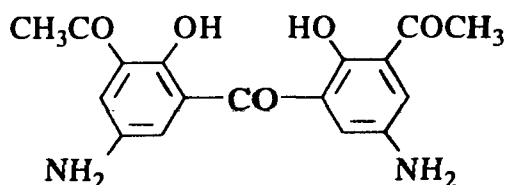
m.p. 254-256° [604]; IR [604], MS [604].

**1,1'-[Carbonylbis(5-amino-2-hydroxy-3,1-phenylene)]bis-ethanone**

[78563-23-2]

C<sub>17</sub>H<sub>16</sub>N<sub>2</sub>O<sub>5</sub>

mol.wt. 328.31



**Synthesis**

-Preparation by Fries rearrangement of 5,5'-di-acetamido-2,2'-diacetoxybenzophenone with aluminium chloride at 175-178° for 20 min (80%) [604].

m.p. 254-255° [604]; IR [604], MS [604].

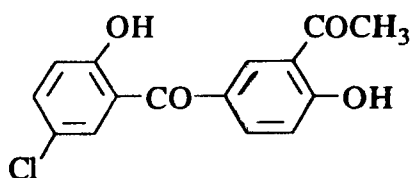
Asymmetrical ketones

**1-[5-(5-Chloro-2-hydroxybenzoyl)-2-hydroxyphenyl]ethanone**

[220042-68-2]

C<sub>15</sub>H<sub>11</sub>ClO<sub>4</sub>

mol.wt. 290.70



**Synthesis**

-Obtained (20% yield) by adding a solution of 6-chloro-4-oxo-4*H*-1-benzopyran-3-carboxaldehyde in acetic acid to a preheated (70-80°) mixture of acetylacetone in acetic acid containing a catalytic amount of concentrated hydrochloric acid [131].

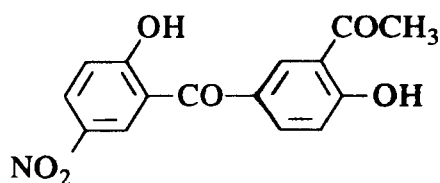
m.p. 144° [131]; <sup>1</sup>H NMR [131], IR [131].

**1-[2-Hydroxy-5-(2-hydroxy-5-nitrobenzoyl)phenyl]ethanone**

[220042-69-3]

C<sub>15</sub>H<sub>11</sub>NO<sub>6</sub>

mol.wt. 301.26



**Synthesis**

-Obtained (30% yield) by adding a solution of 6-nitro-4-oxo-4*H*-1-benzopyran-3-carboxaldehyde in acetic acid to a preheated (70-80°) mixture of acetylacetone in acetic acid containing a catalytic amount of concentrated hydrochloric acid [131].

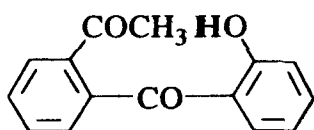
m.p. 174° [131]; <sup>1</sup>H NMR [131], IR [131].

**1-[2-(2-Hydroxybenzoyl)phenyl]ethanone**

[17526-21-5]

C<sub>15</sub>H<sub>12</sub>O<sub>3</sub>

mol.wt. 240.26



**Synthesis**

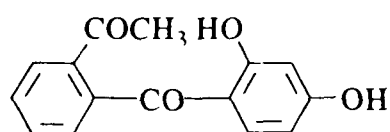
-Refer to: [968].

**1-[2-(2,4-Dihydroxybenzoyl)phenyl]ethanone**

[36414-93-4]

C<sub>15</sub>H<sub>12</sub>O<sub>4</sub>

mol.wt. 256.26



Syntheses

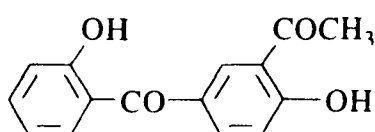
-Refer to: [308] [968]

**1-[2-Hydroxy-5-(2-hydroxybenzoyl)phenyl]ethanone**

[124208-69-1]

C<sub>15</sub>H<sub>12</sub>O<sub>4</sub>

mol.wt. 256.26



Syntheses

-Obtained (17% yield) by adding a solution of 4-oxo-4*H*-1-benzopyran-3-carboxaldehyde in acetic acid to a preheated (70-80°) mixture of acetylacetone in acetic acid

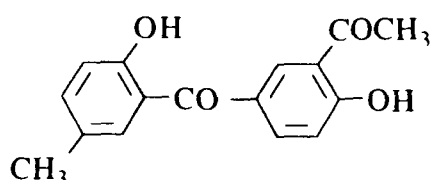
containing a catalytic amount of concentrated hydrochloric acid [131].  
-Also refer to. [968].

m p. 128° [131], <sup>1</sup>H NMR [131], IR [131]**1-[2-Hydroxy-5-(2-hydroxy-5-methylbenzoyl)phenyl]ethanone**

[220042-67-1]

C<sub>16</sub>H<sub>14</sub>O<sub>4</sub>

mol.wt. 270.28



Synthesis

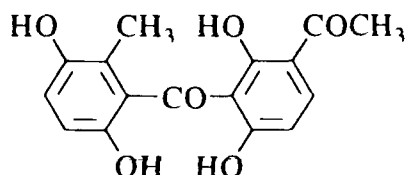
-Obtained (15% yield) by adding a solution of 6-methyl-4-oxo-4*H*-1-benzopyran-3-carboxaldehyde in acetic acid to a preheated (70-80°) mixture of acetylacetone in acetic acid containing a catalytic amount of concentrated hydrochloric acid [131].

m.p. 141° [131]; <sup>1</sup>H NMR [131], IR [131].**1-[3-(3,6-Dihydroxy-2-methylbenzoyl)-2,4-dihydroxyphenyl]ethanone**  
(*Baishouwubenzophenone*)

[115834-34-9]

C<sub>16</sub>H<sub>14</sub>O<sub>6</sub>

mol.wt. 302.28



Isolation from natural sources

-From *Baishouwu*, the botanical source of which being chiefly the tuber of *Cynanchum auriculatum* Royle ex Wight (Asclepiadaceae) [569].

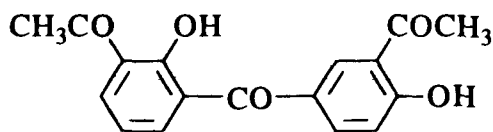
-Also refer to: [968].

<sup>1</sup>H NMR [569], <sup>13</sup>C NMR [569], IR [569], UV [569], MS [569].

**1-[3-(3-Acetyl-4-hydroxybenzoyl)-2-hydroxyphenyl]ethanone**

C<sub>17</sub>H<sub>14</sub>O<sub>5</sub>

mol.wt. 298.30



m.p. 152° [181]; IR [181].

**Synthesis**

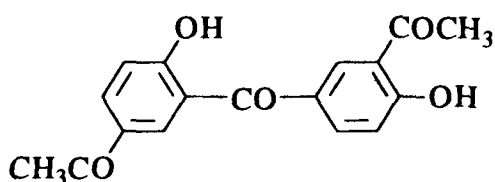
-Obtained (by-product) by Fries rearrangement of 2,4'-diacetoxybenzophenone with aluminium chloride at 158-160° for 2 h (< 2%) [181].

**1-[3-(3-Acetyl-4-hydroxybenzoyl)-4-hydroxyphenyl]ethanone**

[124208-68-0]

C<sub>17</sub>H<sub>14</sub>O<sub>5</sub>

mol.wt. 298.30



**Synthesis**

-Preparation by Fries rearrangement of 2,4'-diacetoxybenzophenone with aluminium chloride at 158-160° for 2 h (60%) [181].

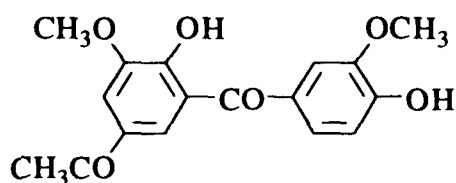
m.p. 184-185° [181]; IR [181].

**1-[4-Hydroxy-3-(4-hydroxy-3-methoxybenzoyl)-5-methoxyphenyl]ethanone**

[147904-65-2]

C<sub>17</sub>H<sub>16</sub>O<sub>6</sub>

mol.wt. 316.31



**Synthesis**

-Obtained by alkaline CuO oxidation of lignin (compound Vo5Vn) named 5-vanilloacetovanillone [570].

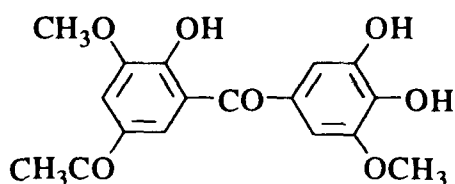
GC [570], GC-MS [570].

**1-[3-(3,4-Dihydroxy-5-methoxybenzoyl)-4-hydroxy-5-methoxyphenyl]ethanone**

[147904-69-6]

C<sub>17</sub>H<sub>16</sub>O<sub>7</sub>

mol.wt. 332.31



**Synthesis**

-Obtained by alkaline CuO oxidation of lignin [570].

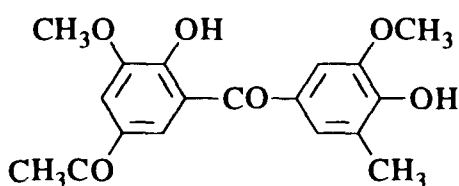
GC [570], GC-MS [570].

**1-[4-Hydroxy-3-(4-hydroxy-3-methoxy-5-methylbenzoyl)-5-methoxyphenyl]ethanone**

[147904-68-5]

C<sub>18</sub>H<sub>18</sub>O<sub>6</sub>

mol.wt. 330.34



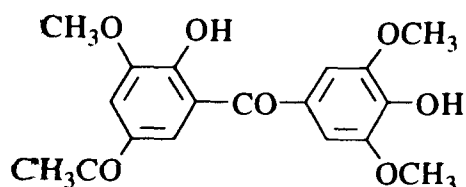
**Synthesis**

-Obtained by alkaline CuO oxidation of lignin [570].

GC [570], GC-MS [570].

**1-[4-Hydroxy-3-(4-hydroxy-3,5-dimethoxybenzoyl)-5-methoxyphenyl]ethanone** $C_{18}H_{18}O_7$ 

mol.wt. 346.34

**Synthesis**

-Obtained by alkaline CuO oxidation of lignin (compound S.5Vn) named 5-syringoacetovanillon [570].

GC [570], GC-MS [570].

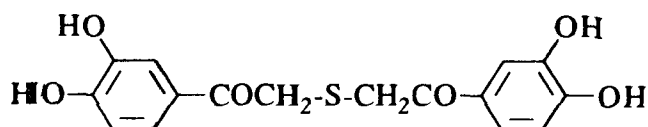
## 12.2.2. Miscellaneous

**2,2'-Thiobis-1-(3,4-dihydroxyphenyl)ethanone**

[21 5431-54-2]

 $C_{16}H_{14}O_6S$ 

mol.wt. 334.35

**Synthesis**

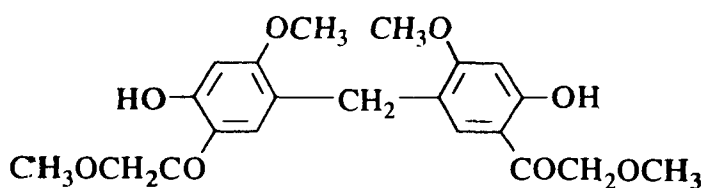
-Refer to: [618] (Japanese patent).

**1,1'-[Methylenebis(6-hydroxy-4-methoxy-3,1-phenylene)]bis[2-methoxyethanone]**

[71 204-18-7]

 $C_{21}H_{24}O_8$ 

mol.wt. 404.42

**Synthesis**

-Obtained from 2-hydroxy-4,α-dimethoxyacetophenone with formaldehyde and 35% aqueous sulfuric acid [1022].

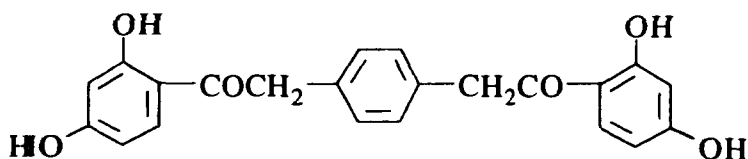
m.p. 152° [1022]; (dibenzoate: m.p. 95-96°) [1022].

**1-(2,4-Dihydroxyphenyl)-2-[4-[2-(2,4-dihydroxyphenyl)-2-oxoethyl]phenyl]ethanone**  
*α,α-bis-(2,4-dihydroxybenzoyl)-p-xylene*

[97829-54-4]

 $C_{22}H_{18}O_6$ 

mol.wt. 378.38



-Also refer to: [1191].

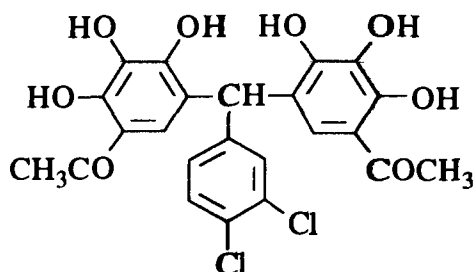
m.p. 282° (d) [1191] [1266].

**Syntheses**

-Preparation by reaction of 1,4-dicyanobenzene (terephthalonitrile) with resorcinol (Hoesch reaction) (52%) [1266].

**1,1'-[[ (3,4-Dichlorophenyl)methylene]bis(4,5,6-trihydroxy-3,1-phenylene)]bis-ethanone**

$C_{23}H_{18}Cl_2O_8$  mol.wt. 493.30



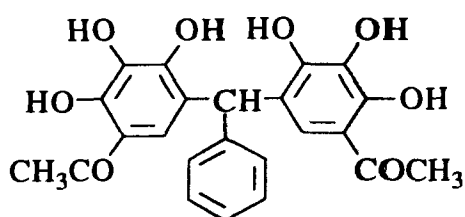
**Synthesis**

-Obtained by condensation of one mol. of 3,4-dichlorobenzaldehyde (m.p. 41-44°) with two mol. of gallacetophenone [252].

m.p. 259-260° [252].

**1,1'-[(Phenylmethylene)bis(4,5,6-trihydroxy-3,1-phenylene)]bis-ethanone**

$C_{23}H_{20}O_8$  mol.wt. 424.41



**Synthesis**

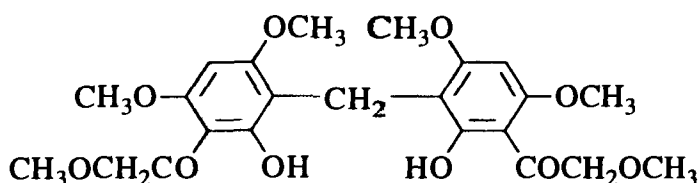
-Obtained by condensation of benzaldehyde (1 mol) with gallacetophenone (2 mol) in saturated ethanol with hydrogen chloride [190] [252].

dihydrate [190]; m.p. 226° [190].

**1,1'-[Methylenebis(2-hydroxy-4,6-dimethoxy-3,1-phenylene)]bis[2-methoxyethanone]**

[71204-19-8]

$C_{23}H_{28}O_{10}$  mol.wt. 464.47



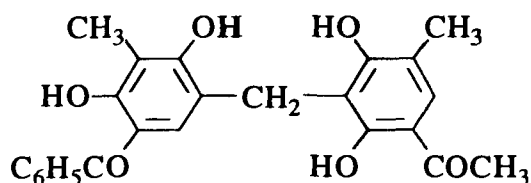
**Synthesis**

-Obtained from 2-hydroxy-4,6,α-trimethoxyacetophenone on refluxing with formaldehyde and 35% aqueous sulfuric acid [1022].

m.p. 232-234° [1022]; (monobenzoate, m.p. 176-178°) [1022].

**1-[3-[(5-Benzoyl-2,4-dihydroxy-3-methylphenyl)methyl]-2,4-dihydroxy-5-methylphenyl]ethanone**

$C_{24}H_{22}O_6$  mol.wt. 406.44



**Synthesis**

-Obtained by action of 40% aqueous formaldehyde with a mixture of 5-methylresacetophenone and 3-methylresbenzophenone (1:1) in ethanol in the presence of concentrated sulfuric acid at r.t. for 3 days (27%) [985].

m.p. 239-240° [985].

**1,1'-[[[(4-Hydroxy-3-methoxyphenyl)methylene]bis(4,6-dihydroxy-3,1-phenylene)]bis-ethanone**

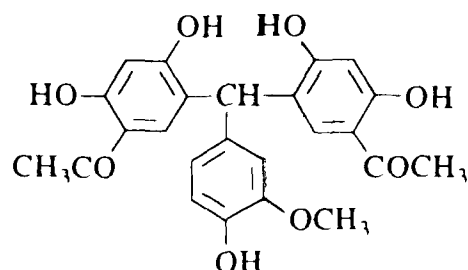
[146533 78-0]

C<sub>24</sub>H<sub>22</sub>O<sub>8</sub>

mol wt 438.44

Synthesis

-Refer to [1484]



**1-[3-[(3-Acetyl-2,4-dihydroxy-6-methoxy-5-methylphenyl)methyl]-5-(2,3-dihydroxy-3-methylbutyl)-2,4,6-trihydroxyphenyl]ethanone**

*(Mallotojaponol)*

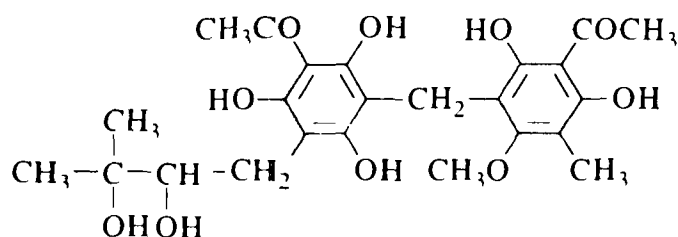
[131836 01-6] (racemic)

C<sub>24</sub>H<sub>30</sub>O<sub>10</sub>

mol wt 478.18

Isolation from natural sources

From the pericarps of *Mallotus japonicus* Muell Arg (Euphorbiaceae) [70]



m p 150-151° [70]

n<sub>D</sub><sup>20</sup> = 0° (c = 0.1 in chloroform) [70].<sup>1</sup>H NMR [70], IR [70], UV [70], EIMS [70]

**1-[3-[(3-Acetyl-2,4-dihydroxy-6-methoxy-5-methylphenyl)methyl]-2,4,6-trihydroxy-5-(3-methyl-2-butenyl)phenyl]-1-butanone**

*(Butyl mallotojaponin)*

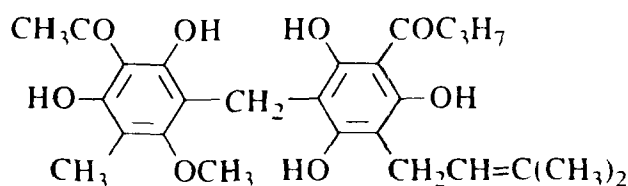
[96853 73-5]

C<sub>26</sub>H<sub>32</sub>O<sub>8</sub>

mol wt 472.54

Isolation from natural sources

-From the pericarps of *Mallotus japonicus* Muell Arg (Euphorbiaceae) [70] [71] [74] [76] [77] [525] [833]

<sup>1</sup>H NMR [833], <sup>13</sup>C NMR [833], IR [833], MS [833], Cytotoxicity [525]

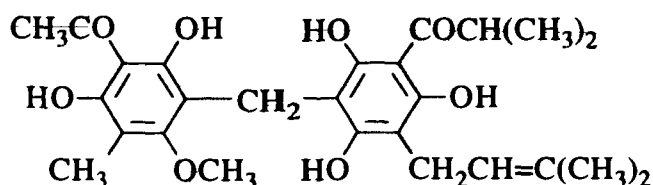


**1-[3-[(3-Acetyl-2,4-dihydroxy-6-methoxy-5-methylphenyl)methyl]-2,4,6-trihydroxy-5-(3-methyl-2-butenyl)phenyl]-2-methyl-1-propanone**  
(*Isobutyrylmallotojaponin*)

[96853-74-6]

C<sub>26</sub>H<sub>32</sub>O<sub>8</sub>

mol.wt. 472.54



Isolation from natural sources

-From the pericarps of *Mallotus japonicus* Muell. Arg. (Euphorbiaceae)  
[70] [71] [74] [76] [77] [525] [833].

<sup>1</sup>H NMR [833], <sup>13</sup>C NMR [833], IR [833], MS [833]; Cytotoxicity [525].

**1-[3-[(3-Acetyl-2,4-dihydroxy-6-methoxy-5-methylphenyl)methyl]-2,4,6-trihydroxy-5-(2-hydroxy-3-methyl-3-butenyl)phenyl]-1-butanone**  
proposed name *butyrylmallotolerin*\* (old name *mallotolerin*)\*\*

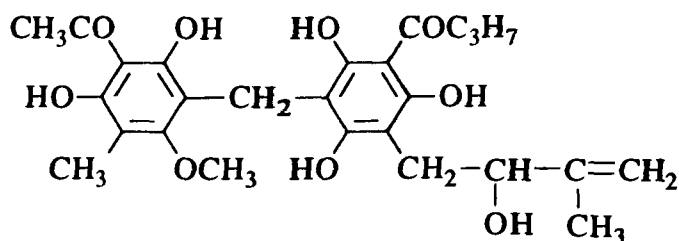
[102904-17-6] (racemic)

C<sub>26</sub>H<sub>32</sub>O<sub>9</sub>

mol.wt. 488.54

[130778-21-1]

(optical isomer not indicated)



Isolation from natural sources

-From the pericarps of *Mallotus japonicus* Muell. Arg. (Euphorbiaceae)  
[70]\* [71] [72] [73] [74] [76]\*\*  
[525].

m.p. 197-198° [76];

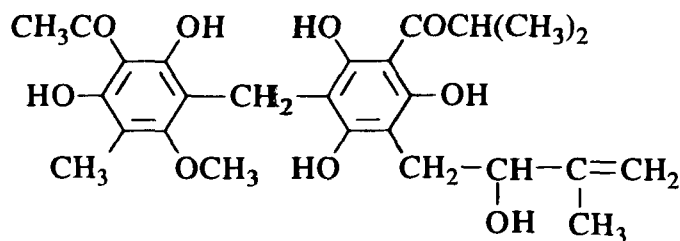
<sup>1</sup>H NMR [73] [76], <sup>13</sup>C NMR [72] [73] [76], IR [76], UV [76], MS [76];  
Cytotoxicity [525].

**1-[3-[(3-Acetyl-2,4-dihydroxy-6-methoxy-5-methylphenyl)methyl]-2,4,6-trihydroxy-5-(2-hydroxy-3-methyl-3-butenyl)phenyl]-2-methyl-1-propanone**  
proposed name *isobutyrylmallotolerin*\* (old name *Isomallotolerin*)

[126026-30-0]

C<sub>26</sub>H<sub>32</sub>O<sub>9</sub>

mol.wt. 488.54



Isolation from natural sources

-From the pericarps of *Mallotus japonicus* Muell. Arg. (Euphorbiaceae)  
[70]\* [71] [72] [73] [74].

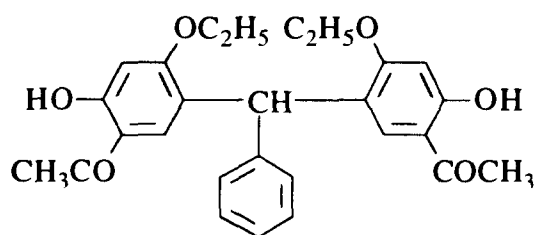
m.p. 216-217° [72];

(α)<sub>D</sub><sup>23</sup> = 0° (c = 0.63 in chloroform) [72];

<sup>1</sup>H NMR [72] [73], <sup>13</sup>C NMR [72] [73], IR [72], UV [72], MS [72].

**1,1'-[(Phenylmethylene)bis(4-ethoxy-6-hydroxy-3,1-phenylene)]bis-ethanone**C<sub>27</sub>H<sub>28</sub>O<sub>6</sub>

mol.wt. 448.52

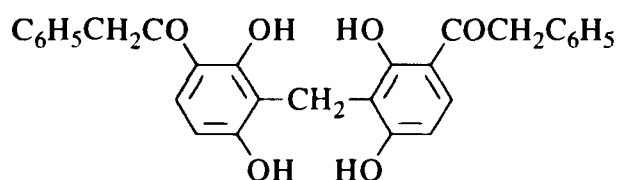
**Synthesis**

-Obtained by condensation of resacetophenone 4-ethyl ether (2 mol) with benzaldehyde (1 mol) in the presence of hydrogen chloride in ethanol [190].

m.p. 211° [190].

**1,1'-[Methylenebis(2,4-dihydroxy-3,1-phenylene)]bis[2-phenylethanone]**C<sub>29</sub>H<sub>24</sub>O<sub>6</sub>

mol.wt. 468.50

**Synthesis**

-Obtained by treatment of 2,4-dihydroxydeoxybenzoin with methylene iodide in the presence of sodium ethoxide in ethanol (29%) [595].

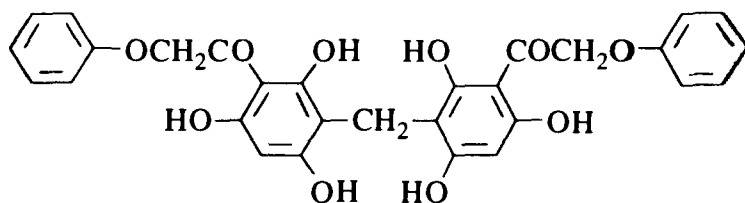
m.p. 191-192° [595]; IR [595], UV [595].

**1,1'-[Methylenebis(2,4,6-trihydroxy-3,1-phenylene)]bis-[2-phenoxyethanone]**

[243465-50-1]

C<sub>29</sub>H<sub>24</sub>O<sub>10</sub>

mol.wt. 532.50

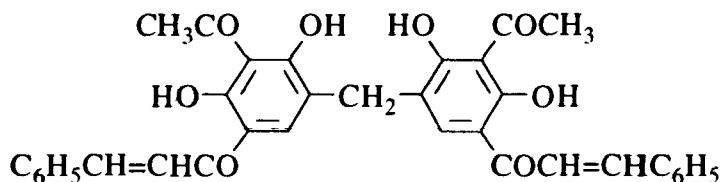
**Synthesis**

-The Mannich reaction of α-phenoxy-2,4,6-trihydroxyacetophenone with aminoacids led to the exclusive formation of bis-(α-phenoxy-2,4,6-trihydroxy-

acetophenon-3-yl)methane (26%) [540].

m.p. 239° [540]; <sup>1</sup>H NMR [540].**1,1'-[Methylenebis(5-acetyl-4,6-dihydroxy-3,1-phenylene)]bis-[3-phenyl-2-propen-1-one]**[84422-51-5] (*E,E*)C<sub>35</sub>H<sub>28</sub>O<sub>8</sub>

mol.wt. 576.60

**Synthesis**

-Obtained by reaction of benzaldehyde with 3,3',5,5'-tetraacetyl-2,2',4,4'-tetrahydroxydiphenylmethane in ethanol in the presence of aqueous potassium

hydroxide, first with shaking for 30 min, then the reaction mixture was kept in the refrigerator for 48 h (10%) [1023].

m.p. 220° [1023]; <sup>1</sup>H NMR [1023]; TLC [1023], column chromatography [1023].

## REFERENCES

- 1 Aarons, S.; Abbas, A.; Adams, C.; Fenton, A. and O'Gara, F.: *J. Bacteriol.* **182** (14) 3913-3919 (2000); *Chem. Abstr.*, **133**, 234887m (2000).
- 2 Abbas, A.; Morrissey, J. P.; Marquez, P. C.; Sheehan, M. M.; Delany, I. R. and O'Gara, F.: *J. Bacteriol.* **184** (11) 3008-3016 (2002).
- 3 Abe, K.; Sakaino, Y.; Kakinuma, J. and Kakisawa, H.: *Nippon Kagaku Kaishi*, (8) 1197-1204 (1977); *Chem. Abstr.*, **87**, 153403e (1977).
- 4 Abildgaard, J.; Bolvig, S. and Hansen, P. E.: *J. Am. Chem. Soc.*, **120** (35) 9063-9069 (1998).
- 5 Adams, R. (ed), *Organic Reactions* [Russian translation], Vol. 5, Inos. Lit., Moscow (1951), p. 284.
- 6 Adams, R.: *J. Am. Chem. Soc.*, **41**, 247-270 (1919).
- 7 Addison, A. W.: *Inorg. Nucl. Chem. Letters*, **12**, 899-903 (1976).
- 8 Adhikari, M. V. and Samant, S. D.: *Ultrason. Sonochem.*, **9** (2) 107-111 (2002); *Chem. Abstr.*, **137**, 247456c (2002).
- 9 Adlercreutz, H.; Bannwart, C.; Wahala, K.; Makela, T.; Brunow, G.; Hase, T.; Arosemena, P. J.; Kellis, J. T., Jr. and Vickery, L. E.: *J. Steroid Biochem. Mol. Biol.*, **44** (2) 147-153 (1993); *Chem. Abstr.*, **119**, 2651n (1993).
- 10 Agarwal, N.: M. Pharm. Thesis, Hamdard University, New Delhi, India (1994).
- 11 Aggarwal, S. K.; Grover, S. K. and Seshadri, T. R.: *Indian J. Chem.*, **7** (10) 1059-1060 (1969).
- 12 Aggarwal, S. K.; Grover, S. K. and Seshadri, T. R.: *Indian J. Chem.*, **10** (8) 804-807 (1972).
- 13 Aghoramurthy, K.; Narasimhachari, N. and Seshadri, T. R.: *Proc. Indian Acad. Sci.*, **33A**, 257-263 (1951).
- 14 Ahluwalia, V. K. and Mehta, S.: *Indian J. Chem., Sect. B*: **15B** (12) 1097-1099 (1977).
- 15 Ahluwalia, V. K. and Prakash, Chandra: *Indian J. Chem., Sect. B*: **14B** (8) 586-588 (1976).
- 16 Ahluwalia, V. K. and Prakash, Chandra: *Indian J. Chem.*, **13** (8) 791-794 (1975).
- 17 Ahluwalia, V. K. and Prakash, Chandra: *Indian J. Chem., Sect. B*, **14B** (11) 858-860 (1976).
- 18 Ahluwalia, V. K.; Ghazanfari, F. A. and Arora, K. K.: *Synthesis*, (7) 526-527 (1981).
- 19 Ahluwalia, V. K.; Kaila, N. and Bala, S.: *Indian J. Chem.*, **25B** (6) 663-664 (1986).
- 20 Ahluwalia, V. K.; Prakash, Chandra and Singh, R. P.: *Chem. Ind. (London)*, **11**, 464-465 (1980).
- 21 Ahluwalia, V. K.; Prakash, Chandra and Singh, R. P.: *Aust. J. Chem.*, **32** (6) 1361-1367 (1979).
- 22 Ahluwalia, V. K.; Prakash, Chandra and Singh, R. P.: *Tetrahedron*, **35** (17) 2081-2085 (1979).
- 23 Ahmad-Junan, S. A. and Whiting, D. A.: *J. Chem. Soc., Perkin Trans. 1*, (2) 418-419 (1990).
- 24 Ahmad-Junan, S. A. and Whiting, D. A.: *J. Chem. Soc., Perkin Trans. 1*, (6) 675-678 (1992).
- 25 Aino, K.; Maki, H.; Shimizu, K.; maekawa, Y.; Akyma, T. and Hayashi, K.: *Jpn. Kokai Tokkyo Koho JP 08,268,825* [96,268,825] (1996); *Chem. Abstr.*, **126**, 28026g (1997).
- 26 Al-Ani, H. A. M. and Dewick, P. M.: *J. Chem. Soc., Perkin Trans. 1*, (12) 2831-2838 (1984).
- 27 Al-Azawe, Subhi S.: *Iraqi J. Sci.*, **31** (2) 273-289 (1990); *Chem. Abstr.*, **114**, 81673u (1991).
- 28 Albert, A. I. and Zilliken, F. W.: *Eur. Pat. Appl. EP 267,155* (1988); *Chem. Abstr.*, **109**, 149354v (1988).
- 29 Algar, J.; McCarthy, I. B. and Dick, E. M.: *Proc. R. Irish Acad.*, **41**, 155-160 (1933).
- 30 Ali, F. E.; Bondinell, W. H.; Huffman, W. F.; Lago, M. A.; Keenan, R. McCulloch; Kwon, C.; Miller, W. H.; Nguyen, T. and Takata, D. T.: *PCT Int. Appl. WO 96 00, 730* (1996); *Chem. Abstr.*, **124**, 289584e (1996).

- 31 Ali, F. E.; Bondinell, W. H.; Keenan, R. McCulloch; Ku, T. Wen Fu; Miller, W. H. and Samanen, J.: PCT Int. Appl. WO 97 24,122 (1997); Chem. Abstr., **127**, 149074a (1997).
- 32 Ali, F. E.; Bondinell, W. H.; Keenan, R. McCulloch; Ku, T. Wen Fu; Miller, W. H. and Samanen, J.: PCT Int. Appl. WO 97 24,124 (1997); Chem. Abstr., **127**, 149073z (1997).
- 33 Allan, J. and Robinson, R.: J. Chem. Soc., **125**, 2192-2195 (1924).
- 34 Allan, J. and Robinson, R.: J. Chem. Soc., 2334-2336 (1926).
- 35 Allen, J.; Schofield, J.; Vassal, T.; Frost, J. and Bertin, J.: Fr. Demande FR 2,696,741 (1994); Chem. Abstr., **121**, 133978p (1994).
- 36 Allewelt, A. L. and Day, A. R.: J. Org. Chem., **6**, 384-400 (1941).
- 37 Alpatova, T. V.; Kovtun, V. Yu.; Olovyanishnikova, Z. A.; Klimova, A. D.; Kulinskii, V. N. and Yashunskii, V. G.: Khim. Farm. Zh., **22** (11) 1349-1355 (1988).
- 38 Alvaro, M.; Baldovi, V.; Garcia, H.; Miranda, M. A. and Primo, J.: Monatsh. Chem., **121** (4) 267-274 (1990).
- 39 Amin, G. C. and Chaughuley, A. S. U.: J. Sci. Ind. Res., **12B**, 391-392 (1953).
- 40 Amin, G. C. and Shah, N. M.: J. Indian Chem. Soc., **29** (5) 351-356 (1952).
- 41 Amin, G. C.; Chaughuley, A. S. U. and Jadhav, G. V.: J. Indian Chem. Soc., **36** (12) 833-837 (1959).
- 42 Amin, G. C.; Chaughuley, A. S. U. and Jadhav, G. V.: J. Indian Chem. Soc., **36** (9) 617-621 (1959).
- 43 Andeno, B. V.: Japan Kokai 75 14,653 (1975); Chem. Abstr., **85**, 46217j (1976).
- 44 Andersen, S. O. and Barrett, F. M.: J. Insect Physiol. **17** (1) 69-83 (1971).
- 45 Andersen, S. O. and Roepstorff, P.: Insect. Biochem., **8** (2) 99-104 (1978).
- 46 Andersen, S. O.: Insect Biochem., **1** (2) 157-170 (1971).
- 47 Andersen, S. O.: J. Insect Physiol., **18**, 527-540 (1972).
- 48 Andersen, S. O.; Jacobsen, J. P. and Roepstorff, P.: Tetrahedron, **36**, 3249-3252 (1980).
- 49 Anderson, B. F.; Briggs, L. H.; Cebalo, T. and Trotman, M. A.: J. Chem. Soc., 1026-1029 (1964).
- 50 Anderson, J. and Olav, S.: J. Insect. Physiol., **16**, 1951-1959 (1970).
- 51 Aneja, R.; Mukerjee, S. K. and Seshadri, T. R.: Tetrahedron, **2**, 203-210 (1958).
- 52 Anjaneyulu, A. S. R. and Isaa, B. M.: Indian J. Pharm. Sci., **54** (2) 71-73 (1992); Chem. Abstr., **117**, 66383t (1992).
- 53 Anjaneyulu, A. S. R. and Isaa, B.: J. Chem. Soc., Perkin Trans. 1, (9) 2089-2094 (1991).
- 54 Anjaneyulu, A. S. R. and Mallavadhani, U. V.: Indian J. Chem., Sect. B: **25B** (5) 515-516 (1986).
- 55 Anjaneyulu, A. S. R. and Mallavadhani, U. V.: J. Chem. Soc., Perkin Trans. 1, (3) 623-628 (1988).
- 56 Anjaneyulu, A. S. R.; Isaa, B. M. and Mallavadhani, U. V.: Indian J. Chem., Sect. B, **26B** (12) 1140-1142 (1987).
- 57 Anjaneyulu, A. S. R.; Mallavadhani, U. V.; Sudharani, G. and Gowri Annapurna, K.: Indian J. Chem., Sect. B, **27B** (3) 233-237 (1988).
- 58 Anjaneyulu, A. S. R.; Mallavadhani, U. V.; Venkateswarlu, Y. and Prasad, A. V. R.: Indian J. Chem., Sect. B, **26B** (9) 823-826 (1987).
- 59 Anjaneyulu, A. S. R.; Prasad, A. V. R. and Reddy, D. S.: Curr. Sci., **48** (7) 300-301 (1979).
- 60 Anon: Res. Discl., **276**, 223 (1987); Chem. abstr., **109**, 54378s (1988).
- 61 Antus, S.; Borosa, F.; Giber, J.; Kajtar-Peredy, M. and Nogradi, M.: Liebigs Ann. Chem., **5**, 995-1003 (1985).
- 62 Apfeld, P. B. and Dimmell, D. R.: J. Wood Chem. Technol., **8** (4) 461-481 (1988); Chem. Abstr., **110**, 233389p (1989).
- 63 APSimon, J. W.; Corran, J. A.; Creasey, N. G.; Marlow, W.; Whalley, W. B. and Sim, K. Y.: J. Chem. Soc., 4144-4156 (1965).
- 64 APSimon, J. W.; Corran, J. A.; Creasey, N. G.; Sim, K. Y. and Whalley, W. B.: J. Chem. Soc., 4130-4143 (1965).
- 65 APSimon, J. W.; Creasey, N. G.; Marlow, W.; Sim, K. Y. and Whalley, W. B.: J. Chem. Soc., 4156-4163 (1965).
- 66 Archibald, S. J.; Blake, A. J.; Schroder, M. and Winpenny, R. E. P.: J. Chem. Soc., Chem. Commun., (14), 1669-1670 (1994).

- 67 Ardis, A. E.; Baltzly, R. and Schoen, W.: *J. Am. Chem. Soc.*, **68**, 591-595 (1946).
- 68 Arens, H.; Ulbrich, B.; Fischer, H.; Deren, N. and Biedermann, J.: *Ger. Offen. DE* 3,601,417 (1987); *Chem. Abstr.*, **107**, 197938u (1987).
- 69 Ariga, M. and Matsumura, E.: *Bull. Chem. Soc. Jpn.*, **60** (3) 1198-1200 (1987).
- 70 Arisawa, M.; Fujita, A. and Morita, N.: *J. Nat. Prod.*, **53** (3) 638-643 (1990); *Chem. Abstr.*, **114**, 78576j (1991).
- 71 Arisawa, M.; Fujita, A.; Hayashi, T.; Hayashi, K.; Ochiai, H. and Morita, N.: *Chem. Pharm. Bull.*, **38** (6) 1624-1626 (1990).
- 72 Arisawa, M.; Fujita, A.; Hayashi, T.; Morita, N.; Kikuchi, T. and Tezuka, Y.: *Chem. Pharm. Bull.*, **38** (3) 698-700 (1990).
- 73 Arisawa, M.; Fujita, A.; Hayashi, T.; Morita, N.; Kikuchi, T.; Tezuka, Y. and Koshimura, S.: *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu*, 31st, 593-600 (1989); *Chem. Abstr.*, **112**, 175572w (1990).
- 74 Arisawa, M.; Fujita, A.; Morita, N. and Koshimura, S.: *Planta Med.*, **56** (4) 377-379 (1990); *Chem. Abstr.*, **114**, 184k (1991).
- 75 Arisawa, M.; Fujita, A.; Morita, N.; Okuyama, T. and Nishino, H.: *J. Nat. Prod.*, **54** (5) 1409-1412 (1991).
- 76 Arisawa, M.; Fujita, A.; Saga, M.; Hayashi, T. and Morita, N.: *J. Nat. Prod.*, **49** (2) 298-302 (1986).
- 77 Arisawa, M.; Fujita, A.; Suzuki, R.; Hayashi, T.; Morita, N.; Kawano, N. and Koshimura, S.: *J. Nat. Prod.*, **48** (3) 455-459 (1985).
- 78 Arkhipov, V. V.; Smirnov, M. N. and Khilya, V. P.: *Chem. Heterocycl. Compd. (N. Y.)*, **33**(5) 515-519 (1997).
- 79 Arnold, G.: *Z. Naturforsch., B: Anorg. Chem., Org. Chem., Biochem., Biophys., Biol.*, **29B** (11-12) 758-764 (1974).
- 80 Arnold, Lee D., Coe, Jotham W.; Kaneko, Takushi and Moyer, Mikel P.: *PCT Int. Appl. WO* 94 22,846 (1994); *Chem. Abstr.*, **122**, 314571s (1995).
- 81 Arnoldi, A.; Bassoli, A.; Borgonovo, G.; Drew, M. G. B.; Merlini, L. and Morini, G.: *J. Agric. Food Chem.*, **46** (10) 4002-4010 (1998).
- 82 Arnoldi, A.; Bassoli, A.; Merlini, L. and Ragg, E.: *J. Chem. Soc., Perkin Trans. 1*, (12)1359-1366 (1993).
- 83 Arnoldi, A.; Bassoli, A.; Merlini, L. and Ragg, E.: *J. Chem. Soc., Perkin Trans. 2* (9) 1399-1406 (1991).
- 84 Arnoldi, A.; Camarda, L. and Merlini, L.: *J. Agric. Food Chem.*, **34**, 339-344 (1986).
- 85 Arora, S. K.; Jain, A. C. and Seshadri, T. R.: *Indian J. Chem.*, **4** (10) 430-432 (1966).
- 86 Arora, S. K.; Jain, A. C. and Seshadri, T. R.: *J. Indian Chem. Soc.*, **38** (2) 61-64 (1961).
- 87 Arventiev, B. and Wexler, H.: *An. Stiint. Univ. "Al. I. Cuza" Iasi, Sect. 1c*, **18** (2) 159-164 (1972); *Chem. Abstr.*, **78**, 58167m (1973).
- 88 Asakawa, Y.: *Bull. Chem. Soc. Jpn.*, **44** (10) 2761-2766 (1971).
- 89 Asscher, M.: *Recl. Trav. Chim. Pays-Bas*, **68**, 960-968 (1949).
- 90 Aswar, A. S. and Bhawe, N. S.: *J. Indian Chem. Soc.*, **68** (4) 191-193 (1991).
- 91 Atkinson, P. W.; Brown, W. V. and Gilby, A. R.: *Insect Biochem.*, **3** (11) 309-315 (1973).
- 92 Auwers, K. v. and Borsche, E.: *Ber. Dtsch. Chem. Ges.*, **48**, 1698-1717 (1915).
- 93 Auwers, K. v. and Mauss, W.: *Ber. Dtsch. Chem. Ges.*, **61**, 1495-1507 (1928).
- 94 Auwers, K. v. and Mauss, W.: *Justus Liebigs Ann. Chem.*, **464**, 293-311 (1928).
- 95 Auwers, K. v.; Müller, K.; Dannehl, H.; Eisenlohr, F.; and Hirt, W.: *Justus Liebigs Ann. Chem.*, **364**, 147-182 (1909).
- 96 Auwers, K. v. and Pohl, P.: *Justus Liebigs Ann. Chem.*, **405**, 243-294 (1914).
- 97 Auwers, K. v.: *Ber. Dtsch. Chem. Ges.*, **48**, 90-93 (1915).
- 98 Auwers, K. v.: *Ber. Dtsch. Chem. Ges.*, **49**, 809-819 (1916).
- 99 Auwers, K. v.: *Ber. Dtsch. Chem. Ges.*, **53**, 2271-2285 (1920).
- 100 Auwers, K. v.: *Ber. Dtsch. Chem. Ges.*, **59**, 2899 (1926).
- 101 Auwers, K. v.; Baum, H. and Lorenz, H.: *J. Prakt. Chem.*, **115**, 81-106 (1927).
- 102 Auwers, K. v.; Bundesman, H. and Wieners, F.: *Justus Liebigs Ann. Chem.*, **447**, 162-196 (1926).
- 103 Auwers, K. v.; Mürbe, E.; Saurwein, K.; Deines, G. and Schorstein, J.: *Fortsch. Chem., Phys., Phys. Chem.*, **18** (2) 37-77 (1924).

- 104 Ayer, D. E.; Bundy, G. L. and Jacobsen, E. J.: PCT Int. Appl. WO 93 20,078 (1993); Chem. Abstr., **121**, 134139c (1994).
- 105 Bachelet, J. P.; Cavier, R.; Lemoine, J.; Rigotherier, M. C.; Gayral, P. and Royer, R.: Eur. J. Med. Chem., **14** (4) 321-424 (1979).
- 106 Badcock, G. G.; Cavill, G. W. K.; Robertson, A. and Whalley, W. B.: J. Chem. Soc., 2961-2965 (1950).
- 107 Bailey, N. A.; Fenton, D. E.; Lay, J.; Roberts, P. B.; Latour, J. M. and Limosin, D.: J. Chem. Soc., Dalton Trans., (12) 2681-2689 (1986).
- 108 Bailey, N. A.; Fenton, D. E.; Roberts, P. B. and Walford, A. M.: J. Chem. Soc., Dalton Trans., **8**, 1865-1868 (1987).
- 109 Baker, S. R.; Ross, W. J. and Jamieson, W. B.: Ger. Offen, 2,936,730 (1980); Chem. Abstr., **94**, 15550u (1981).
- 110 Baker, W. and Eastwood, F. M.: J. Chem. Soc., 2897-2907 (1929).
- 111 Baker, W. and Flemons, G. F.: J. Chem. Soc., 2138-2143 (1948).
- 112 Baker, W. and Robinson, R.: J. Chem. Soc., 152-161 (1929).
- 113 Baker, W. and Robinson, R.: J. Chem. Soc., 2713-2720 (1926).
- 114 Baker, W.: J. Chem. Soc., 71-73 (1934).
- 115 Baker, W.: J. Chem. Soc., 1381-1389 (1933).
- 116 Baker, W.: J. Chem. Soc., 1684-1692 (1934).
- 117 Baker, W.; Chadderton, J.; Harborne, J. B. and Ollis, W. D.: J. Chem. Soc., 1852-1860 (1953).
- 118 Baker, W.; Harborne, J. B. and Ollis, W. D.: Chem. Ind. (London), 1058 (1952).
- 119 Baker, W.; Harborne, J. B. and Ollis, W. D.: J. Chem. Soc., 1860-1864 (1953).
- 120 Baker, W.; Nodzu, R. and Robinson, R.: J. Chem. Soc., 74-84 (1929).
- 121 Baker, W.; Robinson, R. and Simpson, N. M.: J. Chem. Soc., 274-275 (1933).
- 122 Balakrishna, K. J. and Seshadri, T. R.: Proc. Indian Acad. Sci., Sect. A, **27A**, 91-103 (1948).
- 123 Balakrishna, K. J.; Rao, N. P. and Seshadri, T. R.: Proc. Indian Acad. Sci., Sect. A, **29A**, 394-403 (1949).
- 124 Balakrishna, K. J.; Seshadri, T. R. and Viswanath, G.: Proc. Indian Acad. Sci., Sect. A: **33A**, 233-235 (1951).
- 125 Balakrishna, S.; Ramanathan, J. D.; Seshadri, T. R. and Venkataramani, B.: Proc. R. Soc. London A, **268**, 1-20 (1962).
- 126 Balani, R. A. and Sethna, S.: J. Indian Chem. Soc., **45** (5) 390-394 (1968).
- 127 Balasubramanian, A. and Sankaran, P.: Indian J. Chem., **20B**, 989 (1981).
- 128 Balgir, B. S.; Mander, L. N. and Mander, S. T. K.: Aust. J. Chem., **26** (11) 2459-2472 (1973).
- 129 Ballio, A. and Pocchiari, F.: Gazz. Chim. Ital., **79**, 913-923 (1949).
- 130 Ballio, A. and Schiavello, A.: Ricerca Sci., **20**, 993-995 (1950).
- 131 Bandyopadhyay, C.; Sur, K. R. and Patra, R.: J. Chem. Res., Synop. (12) 802-803 (1998).
- 132 Bangera, M. G. and Thomashow, L. S.: J. Bacteriol., **181** (10) 3155-3163 (1999).
- 133 Bantick, J. R.; Cairns, H.; Chambers, A.; Hazard, R.; King, J.; Lee, T. B. and Minshull, R.: J. Med. Chem., **19** (6) 817-821 (1976).
- 134 Bardamova, M. I.; Myasnikova, R. N. and Kotlyarevskii, I. L.: Dokl. Vses. Konf. Khim. Atselilena, 4th., **1**, 241-243 (1972); Chem. Abstr., **79**, 31755k (1973).
- 135 Bargellini, G. and Martegiani, E.: Atti. Accad. Lincei, **20** (2) 183-190 (1911).
- 136 Bargellini, G. and Martegiani, E.: Gazz. Chim. Ital., **41**, 603-612 (1911).
- 137 Barker, G. and Ellis, G. P.: J. Chem. Soc. C, **16**, 2230-2233 (1970).
- 138 Barnes, R. A.; Aguiar, L. S. and Da Costa, R. L.: An. Acad. bras. Cienc., **52** (3) 515-520 (1980); Chem. Abstr., **94**, 174522c (1981).
- 139 Barrenscheen, H. K. and Filz, W.: Biochem. Z., **255**, 344-350 (1932). — — —
- 140 Barrett, F. M.: Insect Biochem., **7** (3) 209-214 (1977); Chem. Abstr., **87**, 130822b (1977).
- 141 Bass, R. J.: J. Chem. Soc., Chem. Commun., (2) 78-79 (1976).
- 142 Bays, D. E.: Brit. UK Pat. GB 2,230,525 (1990); Chem. Abstr., **114**, 163767s (1991).
- 143 Beames, D. J. and Mander, L. N.: Aust. J. Chem., **27** (6) 1257-1268 (1974).
- 144 Becker, H. D.; Björk, A. and Adler, E.: J. Org. Chem., **45** (9) 1596-1600 (1980).

- 145 Becket, G. J. P.; Ellis, G. P. and Trindade, M. I. U.: *J. Chem. Res., Synop.* (2) **47**, 865-884 (1978).
- 146 Becket, G. J. P.; Ellis, G. P. and Trindade, M. I.: *J. Chem. Res., Synop.*, (2) **47** (1978).
- 147 Beckmann, S.; Etzbach, K. H. and Sens, R.: *PCT Int. Appl. WO 95 29,958* (1995); *Chem. Abstr.*, **124**, 120121r (1996).
- 148 Beger, J.; Binte, H. J.; Brunne, L. and Neumann, R.: *J. Prakt. Chem./ Chem.-Ztg.*, **334** (3) 269-277 (1992).
- 149 Beger, J.; Neumann, R.; Vogel, T.; Luecke, L.; Kaestner, G.; Runge, H. J.; Schewe, T.; Schewe, C.; Ludwig, P. and Slapke, J.: *Ger. (East) DD 297,155* (1992); *Chem. Abstr.*, **116**, 214145p (1992).
- 150 Beirne, J. J.; Coyle, A. M. and Donnelly, J. A.: *Tetrahedron*, **26** (15) 3809 (1970).
- 151 Bekassy, S. and Nogradi, M.: *Acta Chim. Acad. Sci. Hung.*, **59** (3-4) 425-429 (1969).
- 152 Bekassy, S.; Farkas, J.; Agai, B. and Figueras, F.: *Topics in Catalysis*, **13** (3) 287-290 (2000).
- 153 Beke, D.; Kovacs, O.; Fabricius, I. and Lam, I.: *Pharm. Zentralhalle Dtschl.*, **92** (7) 237-241 (1953).
- 154 Belen'kii, L. I.; Gromova, G. P. and Gol'dfarb, Ya. L.: *Khim. Geterotsikl. Soedin.*, **5**, 591-596 (1972); *Chem. Abstr.*, **77**, 151767w (1972).
- 155 Belic, I.; Bergant-Dolar, J. and Morton, R. A.: *J. Chem. Soc.*, 2523-2525 (1961).
- 156 Bell, R. P.; Earls, D. W. and Timimi, B. A.: *J. Chem. Soc., Perkin Trans. 2*, (7) **811**-817 (1974).
- 157 Bennett, M.; Burke, A. J. and O'Sullivan, W. I.: *Tetrahedron*, **52** (20) 7163-7178 (1996).
- 158 Bentley, K. W. and Robinson, R.: *J. Chem. Soc.*, 1353-1356 (1950).
- 159 Benton, M. R.; Fryatt, T.; Oldfield, M. F. and Botting, N. P.: *Biologically-Active Phytochemicals in Food*, **269**, 51-55 (2001); *Chem. Abstr.*, **136**, 53596g (2002).
- 160 Berkessel, A.: *Bioorg. Chem.*, **19** (1) 101-115 (1991).
- 161 Berkessel, A.; Bats, J. W.; Bolte, M.; Neumann, T. and Seidel, L.: *Chem. Ber./Recl.*, **130** (7) 891-897 (1997).
- 162 Berkessel, A.; Bats, J. W.; Hueber, M.; Haase, W.; Neumann, T. and Seidel, L.: *Chem. Ber.*, **128** (2) 125-129 (1995).
- 163 Bernauer, K.; Borgulya, J.; Bruderer, H.; Da Prada, M. and Zurcher, G.: *Pat. Specif. (Aust.) AU 603,788* (1990); *Chem. Abstr.*, **115**, 49134d (1991).
- 164 Bertin, D.; Perronnet, J. and Teche, A.: *Ger. Offen 2,225,495* (1972); *Chem. Abstr.*, **78**, 58054x (1973).
- 165 Bertz, S. H.: *Synthesis*, (9) 708-710 (1980).
- 166 Berube, G.; He, Yue-hua; Groleau, S.; Sene, A.; Therien, H.-M. and Caron, M.: *Inorg. Chim. Acta*, **262** (2) 139-145 (1997).
- 167 Betts, W. B. and Dart, R. K.: *Mycol. Res.*, **92** (2) 177-181 (1989); *Chem. Abstr.*, **111**, 20635z (1989).
- 168 Beutler, J. A.; Hamel, E.; Vlietinck, A. J.; Haemers, A.; Rajan, P.; Roitman, J. N.; Cardellina, J. H., II and Boyd, M. R.: *J. Med. Chem.*, **41** (13) 2333-2338 (1998).
- 169 Bezuidenhoudt, B. C. B.; Brandt, E. V.; Steenkamp, J. A. and Roux, D. G.: *J. Chem. Soc., Perkin Trans. 1*, (5) 1227-1235 (1988).
- 170 Bhalerao, U. T.; Raju, B. China and Neelakantan, Parvathi: *Synth. Commun.*, **25** (10) 1433-1439 (1995).
- 171 Bhalerao, U. T.; Raju, B. Chinna and Neelakantan, Parvathi: *Indian J. Chem., Sect. B: Org. Chem. Incl. Med. Chem.*, **33B** (12) 1197-1199 (1994).
- 172 Bhandange, R. E.; Doshi, A. G.; Bhandange, D. G. and Raut, A. W.: *Orient J. Chem.*, **17** (3) 525-526 (2001); *Chem. Abstr.*, **137**, 47065n (2002).
- 173 Bhandari, P. R.; Bose, J. L. and Siddiqui, S.: *J. Sci. Ind. Res.*, **8B** (12) 217-221 (1949).
- 174 Bhandari, P.; Crombie, L.; Daniels, P.; Holden, I.; Van Bruggen, N. and Whiting, D. A.: *J. Chem. Soc., Perkin Trans. 1*, (7) 839-849 (1992).
- 175 Bhardwaj, D. K.; Bansal, M. C.; Bhalla, S.; Shrawat, V. S. and Tyagi, R. C.: *Proc. Indian Natl. Sci. Acad., Part. A*, **54** (4) 635-637 (1988); *Chem. Abstr.*, **111**, 232379u (1989).
- 176 Bhardwaj, D. K.; Chand, G.; Jain, R. K. and Munjal, A.: *Indian J. Chem., Sect. B*, **21B** (11) 1041-1042 (1982).
- 177 Bhargava, P. M. and Sen, A. B.: *J. Sci. Food Agr.*, **1**, 178-182 (1950).

- 178 Bhatt, M. R. and Shah, N. M.: *J. Indian Chem. Soc.*, **33** (5) 318-320 (1956).
- 179 Bhattacharya, A. and Keys, B. A.: U.S. US 5,508,451 (1996); *Chem. Abstr.*, **125**, 33477p (1996).
- 180 Bhatti, S. P.; Singh, O. V.; Garg, C. P. and Kapoor, R. P.: *Indian J. Heterocycl. Chem.*, **7** (2) 89-92 (1997); *Chem. Abstr.*, **128**, 114850u (1998).
- 181 Bhavsar, M. D. and Desai, V. B.: *Man-Made Text. India*, **31** (12) 529-535, 556 (1988); *Chem. Abstr.*, **112**, 7121e (1990).
- 182 Bhumgara, K. S.; Desai, R. D. and Waravdekar, W. S.: *Proc. Indian Acad. Sci.*, **25A**, 322-326 (1947).
- 183 Bigi, F.; Maggi, R.; Sartori, G. and Casnati, G.: *Gazz. Chim. Ital.*, **122**, 283-289 (1992).
- 184 Bird, A. E. and Marshall, A. C.: *J. Chem. Soc. C*, 2418-2420 (1969).
- 185 Birsa, M. L.: *An. Stiint. Univ. "Al. I. Cuza" Iasi, Chim.*, **6**, 57-64 (1998); *Chem. Abstr.*, **132**, 207785z (2000).
- 186 Birsa, M. L.: *An. Stiint. Univ. "Al. I. Cuza" Iasi, Chim.*, **7** (2) 341-347 (1999); *Chem. Abstr.*, **134**, 100787r (2001).
- 187 Birsa, M. L.: *An. Stiint. Univ. "Al. I. Cuza" Iasi, Chim.*, **7** (2) 349-354 (1999); *Chem. Abstr.*, **134**, 100788s (2001).
- 188 Black, D.; Blake, A. J.; Dancey, K. P.; Harrison, A.; McPartlin, M.; Parsons, S.; Tasker, P. A.; Whittaker, G. and Shroder, M.: *J. Chem. Soc., Dalton Trans.*, (23) 3953-3960 (1998).
- 189 Blau, E.: *Monatsh. Chem.*, **26**, 1149-1164 (1905).
- 190 Blumstein, J. and Kostanekci, S.: *Ber. Dtsch. Chem. Ges.*, **33**, 1478-1483 (1900).
- 191 Bobik, A.; Holder, G. M. and Ryan, A. J.: *J. Med. Chem.*, **20** (9) 1194-1199 (1977).
- 192 Boers, F.; Deng, Bo Liang; Lemiere, G.; Lepoivre, j.; De Groot, A.; Dommissse, R. and Vlietinck, A. J.: *Arch. Pharm. (Weinheim, Ger.)*, **330** (9-10) 313-316 (1997).
- 193 Bohlmann, F. and Grenz, M.: *Chem. Ber.*, **108**, 26-30 (1975).
- 194 Bohlmann, F. and Grenz, M.: *Chem. Ber.*, **110**, 295-300 (1977).
- 195 Bohlmann, F. and Vorwerk, E.: *Chem. Ber.*, **113** (1) 261-266 (1980).
- 196 Bohlmann, F. and Vorwerk, E.: *Chem. Ber.*, **114** (1) 147-152 (1981).
- 197 Bohlmann, F.; Mahanta, P. K.; Suwita, A.; Suwita, A.; Natu, A. A.; Zdero, C.; Domer, W.; Ehlers, D. and Grenz, M.: *Phytochemistry*, **16** (12) 1973-1981 (1977).
- 198 Bohlmann, F.; Wallmeyer, M.; King, R. M. and Robinson, H.: *Phytochemistry*, **23** (7) 1513-1514 (1984).
- 199 Böhme, H. and Völcker, P. E.: *Arch. Pharm. (Weinheim, Ger.)*, **292**, 529-536 (1959).
- 200 Bokhari, S. A. N. N. and Whalley, W. B.: *J. Chem. Soc.*, 5322-5327 (1963).
- 201 Bollinger, N. G.; Goodson, T. and Herron, D. K.: U.S. US 4,945,099 (1990); *Chem. Abstr.*, **114**, 42277y (1991).
- 202 Bolvig, S.; Hansen, P. E.; Morimoto, H.; Wemmer, D. and Williams, P.: *Magn. Reson. Chem.*, **38** (7) 525-535 (2000).
- 203 Bonsall, R. F.; Weller, D. M. and Thomashow, L. S.: *Appl. Environ. Microbiol.*, **63** (3) 951-955 (1997); *Chem. Abstr.*, **126**, 260402z (1997).
- 204 Bonte, J. P.; Lesieur, D.; Lespagnol, C. Cazin, J. C. and Cazin, M.: *Eur. J. Med. Chem.*, **9** (5) 497-500 (1974).
- 205 Boon-Long, N.: *J. Pharm. Assoc. Siam*, **1** (4) 5-18 (1948); *Chem. Abstr.*, **43**, 5017i (1949).
- 206 Boote, V. A.; Bruce, J. M.; Clarke, J. A.; Pritchard, A. P. and Speak, R. J.: *Rapid Commun. Mass Spectrom.*, **11** (7) 749-752 (1997); *Chem. Abstr.*, **127**, 17308v (1997).
- 207 Booth, B. L. and Noori, G. F. M.: *J. Chem. Soc., Perkin Trans. 1*, **12**, 2894-2900 (1980).
- 208 Booth, C.; Hargreaves, D. F.; Hadfield, J. A.; McGown, A. T. and Potten, C. S.: *Br. J. Cancer*, **80** (10) 1550-1557 (1999); *Chem. Abstr.*, **131**, 310057s (1999).
- 209 Bora, U.; Bose, G.; Chaudhuri, M. K.; Dhar, S. S.; Gopinath, R.; Khan, A. T. and Patel, B. K.: *Org. Lett.*, **2** (3) 247-249 (2000).
- 210 Borders, C. L. Jr.; Perez, Dianne M.; Lafferty, Mark W.; Kondow, Alexander J.; Brahm, Jesper; Fenderson, Mary B.; Brelsford, Gregy L. and Pett, Virginia B.: *Bioorg. Chem.*, **17** (1) 96-107 (1989).
- 211 Borgulya, J.; Bruderer, H.; Bernauer, K.; Zuercher, G. and Da Prada, M.: *Helv. Chim. Acta*, **72** (5) 952-968 (1989).



- 212 Bors, W.; Michel, C. and Saran, M.: Oxy Radicals Their Scavenger Syst., Proc. Int. Conf. Superoxide Superoxide Dismutase, 3rd 1982 (Pub. 1983) 1, 38-43; Chem. Abstr., 99, 193292x (1983).
- 213 Borsche, W. and Barthenheier, J.: Justus Liebigs Ann. Chem., 553, 250-259 (1942).
- 214 Borthakur, R. C.; Goswami, A.; Goswami, M.; Borthakur, N.; Rastogi, R. C. and Bhattacharya, P. R.: Indian J. Chem., Sect. B, 25B (6) 668-671 (1986).
- 215 Boumendjel, A.; Bois, F.; Beney, C.; Mariotte, A.-M.; Conseil, G. and Di Petro, A.: Bioorg. Med. Chem. Lett., 11 (1) 75-77 (2001) (Pub. 2000).
- 216 Bousquet, E.; Cavrini, V.; Gatti, R. and Spadaro, A.: J. Liq. Chromatogr. Relat. Technol., 21 (18) 2873-2886 (1998).
- 217 Bousquet, E.; Santagati, N. A. and Tirendi, S.: J. Liq. Chromatogr. Relat. Technol., 20 (5) 757-760 (1997).
- 218 Boyd, J. and Robertson, A.: J. Chem. Soc., 174-176 (1948).
- 219 Brachwitz, H.: Z. Chem., 7, 154-166 (1967).
- 220 Brachwitz, H.: Z. Chem., 7, 268-269 (1974).
- 221 Bradbury, R. B. and White, D. E.: J. Chem. Soc., 3447-3449 (1951).
- 222 Bradbury, S. P.; Mekenyan, O.; Veith, G. D. and Zaharieva, N.: SAR QSAR Environ. Res., 4 (2-3) 109-124 (1995); Chem. Abstr., 124, 138080m (1996).
- 223 Brass, K. and Kranz, H.: Justus Liebigs Ann. Chem., 499, 175-187 (1932).
- 224 Brazzell, R. K. and Kostenbauder, H. P.: J. Pharm. Sci., 71 (11) 1274-1281 (1982).
- 225 Brederick, H.; Lehmann, G.; Schönfeld, C. and Fritzsche, E.: Ber. Dtsch. Chem. Ges., 72, 1414-1429 (1939).
- 226 Bretschneider, H. and Hörmann, H.: Monatsh. Chem., 84, 1021-1032 (1953).
- 227 Bretschneider, H. and Sachsenmaier, W.: Monatsh. Chem., 84, 619-628 (1953).
- 228 Bretschneider, H.: Monatsh. Chem., 76, 368-380 (1947).
- 229 Bretschneider, H.: Monatsh. Chem., 81, 372-384 (1950).
- 230 Bretschneider, H.: Sitzungsber. oesterr. akad. wiss. math. naturwiss. Kl. Abt. 2b, B 159, (3-4) 372-384 (1950).
- 231 Brewster, C. M. and Harris, J. C.: J. Am. Chem. Soc., 52, 4866-4872 (1930).
- 232 Brickl, R.; Eberhardt, H.; Appel, K. R.; Lechner, U. and Merck, W.: Ger. Offen. 2,616,479 (1977); Chem. Abstr., 88, 37429q (1978).
- 233 Briggs, L. H. and Locker, R. H.: J. Chem. Soc., 2157-2164 (1949).
- 234 Briggs, L. H. and Locker, R. H.: J. Chem. Soc., 3131-3136 (1951).
- 235 Broadbent, D.; Mabelis, R. P. and Spencer, H.: Phytochemistry, 15 (11) 1785 (1976).
- 236 Broom, N. J. P.; O'Haulon, P. J.; Osborne, N. F. and Pengelly, D.: PCT Int. Appl. WO 95 05,384 (1995); Chem. Abstr., 124, 87687e (1996).
- 237 Brown, F. J.; Bernstein, P. R.; Cronk, L. A.; Dosset, D. L.; Hebbel, K. C.; Maduskuie, T. P., Jr.; Shapiro, H. S.; Vacek, E. P.; Yee, Ying K.; Willard, A. K.; Krell, R. D. and Snyder, D. W.: J. Med. Chem., 32 (4) 807-826 (1989).
- 238 Brüll, J. and Friedlaender, P.: Ber. Dtsch. Chem. Ges., 30, 297-302 (1897).
- 239 Bryan, J. D.; Goldberg, A. A. and Wragg, A. H.: J. Chem. Soc., 1279-1281 (1960).
- 240 Brzezinska, E.: Acta Pol. Pharm., 51 (2) 137-141 (1994); Chem. Abstr., 122, 132942f (1995).
- 241 Buckman, S. J.; Fenyes, J. G. E.; Flanagan, K. J.; Pera, J. D. and Pulido, M. L.: US 3,933,472 (1976); Chem. Abstr., 84, 106378d (1976).
- 242 Buckman, S. J.; Pera, J. D. and Mercer, G. D.: Ger. Offen. 2,051,921 (1971); Chem. Abstr., 75, 37361t (1971).
- 243 Buckman, S. J.; Pera, J. D. and Mercer, G. D.: S. African 70 00,596 (1970); Chem. Abstr., 74, 126850y (1971).
- 244 Buckman, S. J.; Pera, J. D. and Raths, F. W.: Ger. Offen. 1,174,017 (1964); Chem. Abstr., 61, 9987d (1964).
- 245 Bülow, C. and Grotowsky, H.: Ber. Dtsch. Chem. Ges., 35, 1519-1528 (1902).
- 246 Bulut, M.: Chim. Acta Turc. (Pub. 1992), 19 (1) 17-26 (1991); Chem. Abstr., 118, 101686p (1993).
- 247 Buu-Hoi, N. P. and Lavit, D.: J. Chem. Soc., 18-20 (1955).
- 248 Buu-Hoi, N. P. and Seailles, J., Jr.: J. Org. Chem., 20, 606-609 (1955).
- 249 Buu-Hoi, N. P. and Xuong, N. D.: J. Chem. Soc., 386-388 (1953).

- 250 Buu-Hoi, N. P.; Sy, M. and Xuong, N. D.: *Bull. Soc. Chim. Fr.*, 629-632 (1956).
- 251 Buu-Hoi, N. P.; Xuong, N. D. and Lavit, D.: *J. Chem. Soc.*, 1034-1038 (1954).
- 252 Buu-Hoi, N. P.: *J. Org. Chem.*, **18**, 1723-1729 (1953).
- 253 Buu-Hoi, N. P.; Lavit, D. and Xuong, N. D.: *J. Org. Chem.*, **19**, 1617-1621 (1954).
- 254 Byk-Gulden Lomberg, Chemische Fabrik G.m.b.H. (Winterhalder, L. inventor): Ger. **935,363** (1955); *Chem. Abstr.*, **52**, 20061e (1958).
- 255 Byk-Gulden Lomberg, Chemische Fabrik G.m.b.H. (Winterhalder, L. inventor): Ger. **949,288** (1956); *Chem. Abstr.*, **53**, 3150e (1959).
- 256 Cairns, H. and Johnson, P. B.: *Brit.* 1,292,602 (1972); *Chem. Abstr.*, **78**, 43027s (1973).
- 257 Cairns, H. and Johnson, P. B.: Ger. Offen. 1,954,266 (1970); *Chem. Abstr.*, **73**, 25303w (1970).
- 258 Cairns, H. and Minshull, R.: U. S. 3,718,668 (1973); *Chem. Abstr.*, **78**, 136255e (1973).
- 259 Cairns, H.: *Tetrahedron*, **28** (2) 359-361 (1972).
- 260 Cairns, H.; Fitzmaurice, C.; Hunter, D.; Johnson, P. B.; King, J.; Lee, T. B.; Lord, G. H.; Minshull, R. and Cox, J. S. G.: *J. Med. Chem.*, **15** (6) 583-589 (1972).
- 261 Cambie, R. C.: *J. Chem. Soc.*, 2376-2377 (1960).
- 262 Campbell, R. V. M.; Harper, S. H. and Kemp, A. D.: *J. Chem. Soc. C*, (13) 1787-1795 (1969).
- 263 Campbell, T. W. and Coppinger, G. M.: *J. Am. Chem. Soc.*, **73**, 2708-2712 (1951).
- 264 Caporale, G. and Bareggi, A. M.: *Gazz. Chim. Ital.*: **98** (4) 444-457 (1968).
- 265 Carlisle, W. D.; Fenton, D. E.; Mulligan, D. C.; Roberts, P. B.; Vigato, P. A. and Tamburini, S.: *Inorg. Chim. Acta*, **126** (2) 233-235 (1987); *Chem. Abstr.*, **107**, 108009b (1987).
- 266 Carlisle, W. D.; Fenton, D. E.; Roberts, P. B.; Casellato, U.; Vigato, P. A. and Graziani, R.: *Transition Met. Chem. (Weinheim, Ger.)*, **11** (8) 292-295 (1986); *Chem. Abstr.*, **108**, 86708v (1988).
- 267 Cascaval, A. and Barboiu, V.: *Rom. RO* 82,556 (1983); *Chem. Abstr.*, **101**, 130680m (1984).
- 268 Cascaval, A.: *Rom. RO* 91,541 (1987); *Chem. Abstr.*, **108**, 74985v (1988).
- 269 Cascaval, A.: *Synthesis*, (7) 579-580 (1983).
- 270 Cascaval, A.; Sarbu, C.; Cilianu, B. St.; Carstea, A. and Bors, A.: *Rom. RO* 95,546 (1987).
- 271 Casiraghi, G.; Salerno, G. and Sartori, G.: *Synthesis*, (3) 186-187 (1975).
- 272 Castellan, A.; Colombo, N.; Cucuphat, C. and Fournier de Violet, P.: *Holzforschung*, **43** (3) 179-185 (1989); *Chem. Abstr.*, **111**, 117049z (1989).
- 273 Castellan, A.; Girard, P. and Vanucci, C.: *J. Wood Chem. Technol.*, **8** (1) 73-90 (1988); *Chem. Abstr.*, **109**, 8224r (1988).
- 274 Catch, J. R.; Elliott, D. F.; Hey, D. H. and Jones, E. R. H.: *J. Chem. Soc.*, 552-555 (1949).
- 275 Cavallini, G.; Massarani, E.; Mauri, L.; Nardi, D.; Pacchiano, F. and Mantegazza, P.: *Boll. Chim. Farm.*, **103** (1) 48-64 (1964).
- 276 Cave, A.; Leboeuf, M.; Moskowitz, H.; Ranaivo, A.; Bick, I. R. C.; Sinchai, W.; Nieto, M.; Sevenet, T. and Cabaliou, P.: *Aust. J. Chem.*, **42** (12) 2243-2263 (1989).
- 277 Cavill, G. W. K.; Dean, F. M.; McGookin, A.; Marshall, B. M. and Robertson, A.: *J. Chem. Soc.*, 4573-4581 (1954).
- 278 Celli, A. M.; Lampariello, L. R.; Chimichi, S.; Nesi, R. and Scotton, M.: *Can. J. Chem.*, **60** (11) 1327-1332 (1982).
- 279 Chadha, J. S. and Sharma, G. K.: *Bull. Chem. Soc. Jpn.*, **39**, 398 (1966).
- 280 Chadha, T. C.; Mahal, H. S. and Venkataraman, K.: *J. Chem. Soc.*, 1459-1462 (1933).
- 281 Chakravarti, D. and Bera, B. C.: *J. Indian Chem. Soc.*, **21**, 44-46 (1944).
- 282 Chakravarti, D. and Roy, N. N.: *J. Indian Chem. Soc.*, **41** (1) 65-68 (1964).
- 283 Chakravarti, D.; Chakraborty, S.; Chakravarti, N. and Roy, N.: *Sci. Cult.* **28** (5) 242-243 (1962); *Chem. Abstr.*, **58**, 4504a (1963).
- 284 Chand, L.; Maurya, R. and Ray, A. B.: *J. Indian Chem. Soc.*, **59** (8) 1001-1003 (1982).
- 285 Chapman, E. and Stephen, H.: *J. Chem. Soc.*, **123**, 404-409 (1923).
- 286 Chapman, E.; Perkin, A. G. and Robinson, R.: *J. Chem. Soc.*, 3015-3041 (1927).
- 287 Charlesworth, E. H.; Chavan, J. J. and Robinson, R.: *J. Chem. Soc.*, 370-374 (1933).
- 288 Chattaway, F. D.: *J. Chem. Soc.*, 2495-2496 (1931).
- 289 Chatterjea, J. N. and Roy, S. K.: *J. Indian Chem. Soc.*, **34** (3) 155-162 (1957).

- 290 Chatterjea, J. N.; Gupta, S. N. P. and Mehrotra, V. N.: *J. Indian Chem. Soc.*, **42** (4) 205-210 (1965).
- 291 Chavan, J. J. and Robinson, R.: *J. Chem. Soc.*, 368-370 (1933).
- 292 Chen, J. and Li, Y.: *Xiamen Daxue Xuebao*, *Ziran Kexueban*, **31** (6) 651-656 (1992); *Chem. Abstr.*, **120**, 270020p (1994).
- 293 Chen, J. and Li, Y.: *Xiamen Daxue Xuebao*, *Ziran Kexueban*, **32** (2) 249-251 (1993).
- 294 Chen, J.; Yang, W.; Pan, X.; Li, Y. and Tan, Z.: *Huaxue Xuebao* **45** (5) 503-505 (1987); *Chem. Abstr.*, **107**, 236283y (1987).
- 295 Chen, Tian-An; Jen, Alex K.-Y.; Zhang, Yue; Lin, Yue-Jin; Zhang, Xuanqi and Kenney, J.: *Polym. Mater. Sci. Eng.*, **75**, 308-309 (1996); *Chem. Abstr.*, **125**, 233732e (1996).
- 296 Chen, Yong-jun; Ge, Cheng-sheng; Wang, Ming-wen and Wang, Dong: *Yonji Huaxue*, **20** (5) 795-798 (2000); *Chem. Abstr.*, **134**, 147373t (2001).
- 297 Chen, Yuh-Lin; Wang, Yei-Shung; Lin, Yun-Lian; Munakata, K. and Ohta, K.: *Agric. Biol. Chem.*, **42** (12) 2431-2432 (1978); *Chem. Abstr.*, **90**, 135074f (1979).
- 298 Cheshko, F. F. and Distanov, B. G.: *Zh. Obshch. Khim.*, **27**, 2851-2861 (1957).
- 299 Chiba, K.; Arakawa, T. and Tada, M.: *Chem. Commun. (Cambridge)*, (15) 1763-1764 (1996).
- 300 Chiba, K.; Arakawa, T. and Tada, M.: *J. Chem. Soc., Perkin Trans. 1*, (17) 2939-2942 (1998).
- 301 Chihiro, M.; Komatsu, H.; Tominaga, M. and Yabuuchi, Y.: *PCT Int. Appl. WO 92 09,586* (1992); *Chem. Abstr.*, **118**, 191726d (1993).
- 302 Chopin, J. and Pineau, J. P.: *C. R. Acad. Sci., Paris, Ser. C.*, **265** (21) 1172-1174 (1967).
- 303 Chopin, J.; Durual, P. and Chadenson, M.: *Bull. Soc. Chim. Fr.*, **12**, 3572-3577 (1965).
- 304 Chou, C. J.; Lin, L. C.; Chen, K. T. and Chen, C. F.: *J. Nat. Prod.*, **55** (6) 795-799 (1992).
- 305 Chow, P. W. and Jefferies, P. R.: *Aust. J. Chem.*, **21**, 2529-2542 (1968).
- 306 Christopher, S. M.; Myers, R. C. and Ballantyne, B.: *J. Am. Coll. Toxicol.*, **12** (6) 581 (1993); *Chem. Abstr.*, **121**, 51694d (1994).
- 307 Chudgar, N; K;; Mani, N. V. and Sethna, S.: *J. Inst. Chem. (India)*, **39** (5) 203-208 (1967).
- 308 Ciba-Geigy A.-G.: *Jpn. Tokkyo Koho* **80** 12,586 (1980); *Chem. Abstr.*, **93**, 195471e (1980).
- 309 Claisen, L.: *Justus Liebigs Ann. Chem.*, **297**, 1-98 (1897).
- 310 Clark-Lewis, J. W. and Baig, M. I.: *Aust. J. Chem.*, **24**, 2581-2592 (1971).
- 311 Clark-Lewis, J. W. and Williams, L. R.: *Aust. J. Chem.*, **20**, 2151-2167 (1967).
- 312 Clark-Lewis, J. W.; Jemison, R. W. and Nair, V.: *Aust. J. Chem.*, **21** (12) 3015-3024 (1968).
- 313 Claus, A. and Huth, M.: *J. Prakt. Chem.*, **53**, 39-42 (1896).
- 314 Cocker, W., McMurry, T. B. H. and Staniland, P. A.: *J. Chem. Soc.*, 1034-1037 (1965).
- 315 Cohen, M. P.; Shavel, J., Jr. and Von Strandtmann, M.: *U.S.* 4,018,798 (1977); *Chem. Abstr.*, **87**, 23048g (1977).
- 316 Cohen, M. P.; Shavel, J., Jr. and Von Strandtmann, M.: *U.S.* 4,033,845 (1977); *Chem. Abstr.*, **87**, 152019x (1977).
- 317 Cole, B. J. W. and Kwon, H.: *Int. Symp. Wood. Pulping Chem.*, 8th, **1**, 541-548 (1995); *Chem. Abstr.*, **128**, 36143z (1998).
- 318 Collie, J. N.: *J. Chem. Soc.*, **85**, 971-980 (1904).
- 319 Collins, E. and Shannon, P. V. R.: *J. Chem. Soc., Perkin Trans. 1*, (8) 944-952 (1974).
- 320 Collins, I.; Wicks, P. D. and Forfar, A.: *Ger. Offen.* 2,704,895 (1977); *Chem. Abstr.*, **87**, 184202t (1977).
- 321 Coltman, S. C. W.; Eyley, S. C. and Raphael, R. A.: *Synthesis*, (2), 150-152 (1984).
- 322 Connor, D. S. and Krummel, H. K.: *Ger. Offen.* 2,164,872 (1972); *Chem. Abstr.*, **77**, 128512a (1972).
- 323 Connor, D. S. and Krummel, H. K.: *U.S.* 3,699,159 (1972); *Chem. Abstr.*, **78**, 15806b (1973).
- 324 Conrad, P. G., II; Givens, R. S.; Weber, J. F. W. and Kandler, K.: *Org. Lett.*, **2** (11) 1545-1547 (2000).
- 325 Cooke, A.; Anderson, A.; Buchanan, K.; Byford, A.; Gemmel, D.; Hamilton, N.; McPhail, P.; Miller, S.; Sundaram, H. and Vijn, P.: *Bioorg. Med. Chem. Lett.*, **11** (7) 927-930 (2001).

- 326 Corgier, M. and Pacheco, H.: *Therapie*, **28** (4) 639-649 (1973); *Chem. Abstr.*, **80**, 22522a (1974).
- 327 Corrigan, J. R.; Langermann, M. J. and Moore, M. L.: *J. Am. Chem. Soc.*, **67**, 1894-1896 (1945).
- 328 Corrigan, J. R.; Langermann, M. J. and Moore, M. L.: *J. Am. Chem. Soc.*, **71**, 530-531 (1949).
- 329 Corrigan, J. R.; Sullivan, M. J.; Bishop, H. W. and Ruddy, A. W.: *J. Am. Chem. Soc.*, **75**, 6258-6260 (1953).
- 330 Covello, M.; Abignente, E. and Piscopo, E.: *Ann. Chim. (Rome)*, **52**, 213-225 (1962).
- 331 Covello, M.; De Simone, F. and Dini, A.: *Rend. Accad. Sci. Fis. Mat., Naples* **35**, 298-308 (1968).
- 332 Covello, M.; Dini, A. and De Simone, F.: *Rend. Accad. Sci. Fis. Mat., Naples* **36**, 67-71 (1969).
- 333 Covello, M.; Piscopo, E. and Abignente, E.: *Ann. Chim. (Rome)*, **50**, 1651-1665 (1960).
- 334 Cozzi, P.; Branzoli, U.; Lovisolo, P. P.; Orsini, G.; Carganico, G.; Pillan, A. and Chiari, A.: *J. Med. Chem.*, **29** (3) 404-410 (1986).
- 335 Crabbé, P.; Leeming, P. R. and Djerassi, C.: *J. Am. Chem. Soc.*, **80**, 5258-5263 (1958).
- 336 Cragoe, E. J., Jr.; Bealor, M. D.; Robb, C. M.; Ziegler, C. and Sprague, J. M.: *J. Org. Chem.*, **18**, 561-569 (1953).
- 337 Cram, D. J. and Cranz, F. W.: *J. Am. Chem. Soc.*, **72**, 595-600 (1950).
- 338 Cremins, P. J.; Saengchantara, S. T. and Wallace, T. W.: *Tetrahedron*, **43** (13) 3075-3082 (1987).
- 339 Crépieux, M. P.: *Bull. Soc. Chim. Fr.*, (6) 151-161 (1891).
- 340 Crescenzi, E.; Mantegani, A. and Coppi, G.: *Farmaco Ed. Sci.*, **20**, 491-498 (1965).
- 341 Crochet, R. A.; Sullivan, F. R. and Kovacic, P.: *J. Org. Chem.*, **39** (21) 3094-3097 (1974).
- 342 Crombie, L. and Dove, R. V.: *J. Chem. Soc., Chem. Commun.*, (6) 438-439 (1987).
- 343 Crombie, L. and Dove, R. V.: *J. Chem. Soc., Perkin Trans. 1*, (14) 1695-1698 (1996).
- 344 Crombie, L. and Josephs, J. L.: *J. Chem. Soc., Perkin Trans. 1*, (21) 2591-2597 (1993).
- 345 Crombie, L.; Eskins, M.; Games, D. E. and Loader, C.: *J. Chem. Soc., Perkin Trans. 1*, (2) 478-482 (1979).
- 346 Crombie, L.; Games, D. E. and James, A. W. G.: *J. Chem. Soc., Perkin Trans. 1*, (2) 464-471 (1979).
- 347 Crombie, L.; Games, D. E. and Knight, M. H.: *J. Chem. Soc. C*, (8) 757-762 (1967).
- 348 Crombie, L.; Games, D. E. and Knight, M. H.: *Tetrahedron Lett.*, **33**, 2313-2317 (1964).
- 349 Cronin, D.; Moenne-Locaz, Y.; Fenton, A.; Dunne, C.; Dowling, D. N. and O'Gara, F.: *FEMS Microbiol. Ecol.*, **23** (2) 95-106 (1997); *Chem. Abstr.*, **127**, 105546b (1997).
- 350 Cronin, D.; Moenne-Locaz, Y.; Fenton, A.; Dunne, C.; Dowling, D. N. and O'Gara, F.: *Appl. Environ. Microbiol.*, **63** (3) 1357-1361 (1997); *Chem. Abstr.*, **126**, 273629d (1997).
- 351 Cullinane, N. M. and Edwards, B. F. R.: *J. Appl. Chem.*, **9**, 133-136 (1959).
- 352 Cullinane, N. M. and Edwards, B. F. R.: *J. Chem. Soc.*, 434-438 (1958).
- 353 Cushman, M. and Mathew, J.: *Synthesis*, **5**, 397-399 (1982).
- 354 Czaplá, T. H.; Hopkins, T. L. and Kramer, K. J.: *Insect. Biochem.*, **19** (5) 509-515 (1989).
- 355 D'Amico, A.; Bertolini, L. and Monreale, C.: *Chim. Ind. (Milan)*, **38**, 93-99 (1956).
- 356 Dakin, H. D.: *Proc. Royal Soc. (London), Ser. B*, **76**, 491-497 (1905).
- 357 Dakin, H. D.: *Proc. Royal Soc. (London), Ser. B*, **76**, 498-503 (1905).
- 358 Dalvi, V. J. and Jadhav, G. V.: *J. Indian Chem. Soc.*, **34** (4) 324-326 (1957).
- 359 Dang, Y. and Geise, H. J.: *Bull. Soc. Chim. Belg.*, **100** (5) 375-380 (1991).
- 360 Dangles, O. and Elhajji, H.: *Helv. Chim. Acta*, **77** (6) 1595-1610 (1994).
- 361 Dangles, O.; Elhabiri, M. and Brouillard, R.: *J. Chem. Soc., Perkin Trans. 2*, (12), 2587-2596 (1994).
- 362 Danishefsky, Samuel and Walker, Frederick J.: *J. Am. Chem. Soc.*, **101** (23) 7018-7020 (1979).
- 363 Das, R.; Mitra, S.; Nath, D. and Mukherjee, S.: *Indian J. Chem., Sect. A: Inorg., Bio-inorg.; Phys., Theor. Anal. Chem.*, **34A** (11) 850-856 (1995).
- 364 Das, R.; Mitra, S.; Nath, D. and Mukherjee, S.: *J. Chim. Phys. Phys.-Chim. Biol.*, **93** (3) 458-481 (1996).
- 365 Dasgupta, S.; Dutta, S. C. and Ray, A. B.: *Indian J. Chem., Sect. B*: **15B** (2) 197 (1977).

- 366 Davies, J. S. H. and Deegan, T.: *J. Chem. Soc.*, 3202-3206 (1950).
- 367 Davies, J. S. H.; McCrea, P. A.; Norris, W. L. and Ramage, G. R.: *J. Chem. Soc.*, 3206-3213 (1950).
- 368 Dawson, R. M.; Henrick, C. A.; Jefferies, P. R. and Middleton, E. J.: *Aust. J. Chem.*, **18** (11) 1871-1875 (1965).
- 369 De Lampasona, M. E. P.; Catalan, C. A. N.; Gedris, T. E. and Herz, W.: *Phytochemistry*, **46** (6) 1077-1080 (1997).
- 370 De Luynes, V.: *Ann. Chim. Phys.*, **6**, 185-203 (1865).
- 371 De Meyer, N.; Haemers, A.; Mishra, L.; Pandey, H. K.; Pieters, L. A. C.; Van den Berghe, D. A. and Vlietinck, A. J.: *J. Med. Chem.*, **34** (2) 736-746 (1991).
- 372 De Meyer, N.; Haemers, A.; Mishra, L.; Pandey, H. K.; Pieters, L. A. C.; Van den Berghe, D. A. and Vlietinck, A. J.: *J. Med. Chem.*, **35** (26) 4923 (1992).
- 373 De Pascual, T. J.; Bellido, I. S.; Gonzalez, M. S.; Muriel, M. R. and Hernandez, J. M.: *Phytochemistry*, **20** (10) 2417-2420 (1981).
- 374 Dean, F. M. and Robertson, A.: *J. Chem. Soc.*, 1241-1249 (1953).
- 375 Dean, F. M.; Goodchild, J.; Houghton, L. E.; Martin, J. A.; Morton, R. B.; Parton, B.; Price, A. W. and Nongyow Somvichien: *Tetrahedron Lett.*, **35**, 4153-4159 (1966).
- 376 Dekker, T. G.; Fourie, T. G.; Nandé, M. U.; Snyekers, F. O. and Van der Schyf, C. J.: *S. Afr. J. Chem.*, **37** (2) 74-75 (1984); *Chem. Abstr.*, **101**, 151650s (1984).
- 377 Deneke, U.; Guethlein, W. F.; Kuhr, M.; Merdes, H.; Murawski, H. R. and Wielinger, H. E.: *Ger. Offen. DE 3,411,997* (1985); *Chem. Abstr.*, **104**, 145136z (1986).
- 378 Deng, Bo Liang; Lepoivre, J. A.; Lemiere, G.; Dommissse, R.; Claeys, M.; Boers, F. and De Groot, A.: *Liebigs Ann. Recl.*, **10**, 2169-2175 (1997).
- 379 Deng, Bo-Liang; Lepoivre, J. A.; Lemiere, G.; Dommissse, R.; Claeys, M.; Boers, F. and De Groot, A.: *Eur. J. Org. Chem.*, (6) 1243 (1998).
- 380 Denisov, E. T.; Denisova, T. G.; Geletii, Yu. V. and Balavoine, G. G.: *Neftekhimiya*, **37** (5) 402-412 (1997); *Chem. Abstr.*, **128**, 140356g (1998).
- 381 Desai, R. D. and Ekhlal, M.: *Proc. Indian Acad. Sci.*, **8A**, 194-201 (1938).
- 382 Desai, R. D. and Mavani, C. K.: *Curr. Sci.*, **10**, 524 (1941); *Chem. Abstr.*, **36**, 4105<sup>5</sup> (1942).
- 383 Desai, R. D. and Mavani, C. K.: *J. Sci. Ind. Res.* **12B**, 236-239 (1953).
- 384 Desai, R. D. and Mavani, C. K.: *Proc. Indian Acad. Sci.*, **29A**, 269-273 (1949).
- 385 Desai, R. D. and Radha, K. S.: *Proc. Indian Acad. Sci.*, **12A**, 46-49 (1940).
- 386 Desai, R. D. and Vakil, V. M.: *Proc. Indian Acad. Sci.*, **12A**, 391-398 (1940).
- 387 Deschamps-Vallet, C. and Mentzer, C.: *C. R. Acad. Sci., Paris, Ser. C*, **265**, 1280-1283 (1967).
- 388 Deshmukh, R. S. K. and Paradkar, M. V.: *Synth. Commun.*, **18** (6) 589-596 (1988).
- 389 Deshpande, G. R. and Karmarkar, S. S.: *Hindustan Antibiot. Bull.*, **9** (1) 27-30 (1966); *Chem. Abstr.*, **66**, 115388n (1967).
- 390 Deulofeu, V. and Schopflocher, N.: *Gazz. Chim. Ital.*, **83**, 449-458 (1953).
- 391 Devi, N.; Jain, N. and Krishnamurty, H. G.: *Indian J. Chem., Sect. B*: **32B** (8) 874-875 (1993).
- 392 Dhar, M. I.; Narasimhachari, N. and Seshadri, T. R.: *J. Sci. Ind. Res.*, **14B** (2) 73-75 (1955).
- 393 Dhar, M. L.; Pandita, K. and Jain, A. C.: *Chromatographia*, **12** (5) 299-301 (1979); *Chem. Abstr.*, **91**, 67838b (1979).
- 394 Diedrich, D. F.; Scahill, T. A. and Smith, S. L.: *J. Chem. Eng. Data*, **22** (4) 448-450 (1977); *Chem. Abstr.*, **87**, 151966s (1977).
- 395 Dimmel, D. R. and Bovee, L. F.: *J. Wood Chem. Technol.*, **13** (4) 583-592 (1993); *Chem. Abstr.*, **120**, 56960b (1994).
- 396 Dimmel, D. R. and Schuller, L. F.: *J. Wood Chem. Technol.*, **6** (3) 345-365 (1986); *Chem. Abstr.*, **105**, 193103k (1986).
- 397 Dimmel, D. R. and Schuller, L. F.: *J. Wood Chem. Technol.*, **6** (4) 535-564 (1986); *Chem. Abstr.*, **106**, 139963s (1987).
- 398 Dimmel, D. R. and Shepard, D.: *J. Org. Chem.*, **47**, 4799-4800 (1982).
- 399 Dimmel, D. R. and Shepard, D.: *J. Wood Chem. Technol.*, **2**, 297-315 (1982); *Chem. Abstr.*, **98**, 18276c (1983).

- 400 Ding, Yi-Li and Jia, Zhong-Jian: *Phytochemistry*, **31** (4) 1435-1436 (1992).
- 401 Dixit, A. N.; Reddy, K. V.; Deshmukh, A. R. A. S.; Rajappa, S.; Ganguly, B. and Chandrasekhar, J.: *Tetrahedron*, **51** (5) 1437-1448 (1995).
- 402 Dmowski, W.: *J. Fluorine Chem.*, **20**, 589-598 (1982).
- 403 Doherty, J. B.; Dorn, C. P.; Durette, P. L.; Finke, P. E.; MacCoss, M.; Mills, S. G.; Shah, S. K.; Sahoo, S. P.; Polo, S. A. and Hagmann, W. K.: *PCT Int. Appl. WO 94 10,143* (1994); *Chem. Abstr.*, **122**, 160362k (1995).
- 404 Dohme, A. R. L.; Cox, E. H. and Miller, E.: *J. Am. Chem. Soc.*, **48**, 1688-1693 (1926).
- 405 Doifode, K. B. and Marathe, M. G.: *J. Org. Chem.*, **29**, 2025-2026 (1964).
- 406 Dolhem, E.; Barhdadi, R.; Folest, J. C.; Nédelec, J. Y. and Troupel, M.: *Tetrahedron*, **57** (3) 525-529 (2001).
- 407 Dolzhenko, Yu. I.; Tsukerman, S. V.; Polyakov, V. K.; Shevtsova, R. G. and Lutskii, A. E.: *Zh. Obshch. Khim.*, **50** (10) 2337-2339 (1980).
- 408 Dominguez, E.; Lete, E.; Villa, M.-J.; Igartua, A.; Sotomayor, N.; Arrieta, J. M.; Berisa, A.; Labeaga, L.; Orjales, A.; Germain, G. and Nastopoulos, V.: *J. Heterocycl. Chem.*, **28** (2) 1885-1889 (1991).
- 409 Dong, Yunfa and Ding, Yunmei: *Zhiwu Ziyuan Yu Huanjing*, **1** (2) 1-3 (1992); *Chem. Abstr.*, **118**, 56152y (1993).
- 410 Donnelly, D. M. X. and Fitzgerald, M. A.: *Phytochemistry*, **10** (12) 3147-3153 (1971).
- 411 Donnelly, D. M. X.; Kielty, J. M.; Cormous, A. and Finet, J. P.: *J. Chem. Soc., Perkin Trans. 1*, **17**, 2069-2073 (1993).
- 412 Donnelly, J. A. and Maloney, D. E.: *Tetrahedron*, **35**, 2875-2881 (1979).
- 413 Donnelly, J. A. and Murphy, J. J.: *J. Chem. Soc. C*, 2596-2598 (1970).
- 414 Donnelly, J. A.: *Tetrahedron*, **29** (17) 2585-2588 (1973).
- 415 Donnelly, J. A.; Acton, J. P.; Donnelly, D. J. and Philbin, E. M.: *Proc. R. Ir. Acad., Sect. B*, **83 B** (1-16) 49-56 (1983); *Chem. Abstr.*, **100**, 103118g (1984).
- 416 Donnelly, J. A.; Kerr, P. A. and O'Boyle, P.: *Tetrahedron*, **29** (23) 3979-3983 (1973).
- 417 Dorofenko, G. N. and Tkachenko, V. V.: *Khim. Geterotsikl. Soedin*, **2**, 176-180 (1974).
- 418 Dreyer, D. L.; Tabata, S. and Horowitz, R. M.: *Tetrahedron*, **20** (12) 2977-2983 (1964).
- 419 Du, Keyong; Zhang, Peiying and Cai, Mengshen: *Beijing Yike Daxue Xuebao*, **22** (1) 48, 47 (1990); *Chem. Abstr.*, **117**, 130960h (1992).
- 420 Dubois, J. C.; Nguyen Huu Tinh; Zann, A. and Billard, J.: *Nouv. J. Chem.*, **2** (6) 647-651 (1978); *Chem. Abstr.*, **90**, 186508h (1979).
- 421 Dudley, M.: Ph. D. Thesis, University of Chicago, USA, (1991).
- 422 Duffy, B. K. and Defago, G.: *Appl. Environ. Microbiol.*, **66** (8) 3142-3150 (2000); *Chem. Abstr.*, **133**, 265666t (2000).
- 423 Duffy, B. K. and Defago, G.: *Eff. Miner.-Org.-Microorg. Interact. Soil Freshwater Environ.*, [Proc. Int. Symp.], **2** nd 1996 (Pub. 1999) 295-304; *Chem. Abstr.*, **133**, 281141y (2000).
- 424 Duffy, B. K. and Defago, G.: *Phytopathology*, **87** (12) 1250-1257 (1997); *Chem. Abstr.*, **128**, 61058h (1998).
- 425 Dumont, H. and Tambor, J.: *Ber. Dtsch. Chem. Ges.*, **43**, 1969-1970 (1910).
- 426 Duncanson, L. A.; Grove, J. F.; MacMillan, J. and Mulholland, T. P. C.: *J. Chem. Soc.*, 3555-3564 (1957).
- 427 Dupre, S.; Grenz, M.; Jakupovic, J.; Bohlmann, F. and Niemeyer, H. M.: *Phytochemistry*, **30** (4) 1211-1220 (1991).
- 428 Durrwachter, J. R.; Meier, M.; Mott, G. N. and Mueller, W. H.: *U.S. US 5,124,489* (1992); *Chem. Abstr.*, **118**, 6732s (1993).
- 429 Durrwachter, J. R.; Mott, G. N.; Ramos, H., Jr. and Tafesh, A.: *PCT Int. Appl. WO 93 16,975* (1993); *Chem. Abstr.*, **120**, 8329f (1994).
- 430 Dutta, N. L. and Bose, J. L.: *J. Sci. Ind. Res.*, **11B** (10) 413-415 (1952).
- 431 Dutta, P. K.; Bagchi, D. and Pakrashi, S. C.: *Indian J. Chem., Sect. B*: **21B** (11) 1037-1038 (1982).
- 432 Dutta, S. K.; Nanda, K. K.; Floerke, U.; Bhadhbade, M. and Nag, K.: *J. Chem. Soc., Dalton Trans.*, (11) 2371-2379 (1996).
- 433 Dyachenko, V. I.; Kolomiets, A. F. and Fokin, A. V.: *Izv. Akad. Nauk SSSR, Ser. Khim.*, **6**, 1436-1440 (1989); *Chem. Abstr.*, **111**, 214171r (1989).

- 434 Dyke, S. F.; Tiley, E. P.; White, A. W. C. and Gale, D. P.: *Tetrahedron*, **31** (9) 1219-1222 (1975).
- 435 Dzierzgowski, S.: *Beilstein Handbuch der Organischen Chemie*, IV (8) 273
- 436 Dzierzgowski, S.: *Ber. Dtsch. Chem. Ges.*, **27**, 1983-1989 (1894).
- 437 Dzierzgowski, S.: *Zh. Russ. Fiz. Khim. O-va*, **1**, 154-163 (1893).
- 438 East, A. J.; Ollis, W. D. and Wheeler, R. E.: *J. Chem. Soc. C*, 365-374 (1969).
- 439 Ebine, S.: *Sci. Rep. Saitama Univ., Ser. A*, **2A**, 69-78 (1955); *Chem. Abstr.*, **50**, 11971 (1956).
- 440 Echeverri, F.; Torres, F.; Quinones, W.; Cardona, G.; Archbold, R.; Roldan, J.; Brito, I.; Luis, J. G. and Lahlou, El-Hassane: *Phytochemistry*, 1997 (Pub. **1996**), **44** (2) 255-256.
- 441 Eddarir, S.; Abdelhadi, Z. and Rolando, C.: *Tetrahedron Lett.*, **42** (52) 9127-9130 (2001).
- 442 Eglinton, G.; King, F. E.; Lloyd, G.; Loder, J. W.; Marshall, J. R.; Robertson, A. and Whalley, W. B.: *J. Chem. Soc.*, 1833-1842 (1958).
- 443 Eicher, T.; Wobido, M. and Speicher, A.: *J. Prakt. Chem. / Chem.-Ztg.*, **338** (8) 706-710 (1996).
- 444 Eiden, F. and Schaumburg, E. A.: *Ger. Offen.* 2,250,377 (1974); *Chem. Abstr.*, **81**, 37391b (1974).
- 445 Eiden, F. and Teupe, E. G.: *Arch. Pharm. (Weinheim, Ger.)* **314** (3) 223-227 (1981).
- 446 Eiden, F. and Teupe, E. G.: *Arch. Pharm. (Weinheim, Ger.)*, **312** (10) 863-872 (1979).
- 447 Eiden, F.; Leister, H. P. and Mayer, D.: *Arzneim.-Forsch./Drug Res.*, **33** (1) 101-105 (1985).
- 448 Eijkman, J. F.: Bergema, F. and Henrard, I. T.: *Chem. Zentralbl.*, **I**, 814-817 (1905).
- 449 Eijkman, J. F.: *Chem. Zentralbl.*, **1**, 1597 (1904).
- 450 Elhabiri, M.; Figueiredo, P.; George, F.; Cornard, J-P.; Fougereousse, A.; Merlin, J-C. and Brouillard, R.: *Can. J. Chem.*, **74** (5) 697-706 (1996).
- 451 Engelhardt, M.; Fruchstorfer, W.; Hesse, R.; Dennler, B. and Baumer, W.: *Ger. Offen.* 1,811,322 (1968); *Chem. Abstr.*, **73**, 55826 (1970).
- 452 Esipov, S. E.; Adanin, V. M.; Baskunov, B. P.; Kiprianova, E. A. and Garagulya, A. D.: *Antibiotiki (Moscow)*, **20** (12) 1077-1081 (1975); *Chem. Abstr.*, **84**, 87883w (1976).
- 453 Essawy, S. A.; El-Kady, M. Y.; Donia, S. G. and El-Shenawy, A. I.: *Egypt. J. Chem.*, **37** (4) 381-390 (1994); *Chem. Abstr.*, **123**, 111808x (1995).
- 454 Euw, J.; Neher, R.; Reichstein, T.; Tait, S. A. S.; Tait, J. F. and Wettstein, A.: *Helv. Chim. Acta*, **42**, 1817-1829 (1959).
- 455 Evers, H.; Niemann, W.; Böhmer, V. and Kämmerer, H.: *Makromol. Chem.*, **175**, 2255-2274 (1974).
- 456 Eykman, J. F.: *Chem. Weekbl.*, **31**, 453-461 (1904).
- 457 Eykman, J. F.: *Chem. Weekbl.*, **II** (4) 59-72 (1905).
- 458 Eyley, S. C. and Coltman, S. C. W.: *Eur. Pat. Appl. EP* 52,280 (1982); *Chem. Abstr.*, **97**, 144562k (1982).
- 459 Farkas, J.; Bekassy, S.; Agai, B.; Hegedus, M. and Figueras, F.: *Synth. Commun.*, **30** (14) 2479-2485 (2000).
- 460 Farkas, L. and Nogradi, M.: *Acta Chim. Acad. Sci. Hung.*, **58** (1) 93-95 (1968).
- 461 Farkas, L. and Varady, J.: *Chem. Ber.*, **92**, 819-821 (1959).
- 462 Farkas, L.: *Chem. Ber.*, **90**, 2940-2943 (1957).
- 463 Farkas, L.: *Chem. Ind. (London)*, 1212 (1957).
- 464 Farkas, L.; Gottsegen, A. and Nogradi, M.: *Acta Chim. Acad. Sci. Hung.*, **55** (3) 311-317 (1968).
- 465 Farkas, L.; Gottsegen, A.; Nogradi, M. and Antus, S.: *J. Chem. Soc. (C)*, (10) 1994-2000 (1971).
- 466 Farkas, L.; Gottsegen, A.; Nogradi, M. and Antus, S.: *J. Chem. Soc., Perkin Trans. 1*, (2) 305-312 (1974).
- 467 Farkas, L.; Major, A.; Pallos, L. and Varady, J.: *Chem. Ber.*, **91**, 2858-2861 (1958).
- 468 Farkas, L.; Nogradi, M. and Strelisky, J.: *Chem. Ber.*, **99**, 3218-3221 (1966).
- 469 Farkas, L.; Nogradi, M. and Strelisky, J.: *Tetrahedron*, **50**, 4563-4564 (1965).
- 470 Farkas, L.; Nogradi, M. and Vermes, B.: *Chem. Ber.*, **100**, 2296-2300 (1967).
- 471 Farkas, L.; Olechnowicz-Stepien, V. and Wolner, A.: *Magy. Kem. Foly.*, **78** (5) 252-254 (1972); *Chem. Abstr.*, **77**, 34254r (1972).

- 472 Farkas, L.; Wolfner, A. and Olechnowicz-Stepien, V.: *Acta Chim. Acad. Sci. Hung.*, **74** (3) 367-370 (1972); *Chem. Abstr.*, **78**, 16433q (1973).
- 473 Farnos-Yhtyma Oy: *Neth. Appl.* 79 02,407 (1979); *Chem. Abstr.*, **92**, 215050b (1980).
- 474 Farooq, M. O.; Rahman, W. and Ilyas, M.: *Chem. Ber.*, **92**, 2555-2559 (1959).
- 475 Farooq, M. O.; Rahman, W.; Ilyas, M. and Sardar, Jehan: *Chem. Ber.*, **94**, 1996-2001 (1961).
- 476 Fedenok, L. G. and Shvartsberg, M. S.: *Izv. Akad. Nauk SSSR, Ser. Khim.*, (7) 1668-1670 (1991); *Chem. Abstr.*, **115**, 279514g (1991).
- 477 Fedenok, L. G.; Myasnikova, R. N. and Shvartsberg, M. S.: *Izv. Akad. Nauk SSSR, Ser. Khim.* (8) 1836-1839 (1985); *Chem. Abstr.*, **105**, 171957h (1986).
- 478 Ferrari, G. and Casagrande, C.: *Chim. Ind. (Milan)*, **43**, 621-624 (1961).
- 479 Ferreira, D.; van der Merwe, J. P. and Roux, D. G.: *J. Chem. Soc., Perkin Trans. 1*, 1492-1498 (1974).
- 480 Ferreira, J. A.; Nel, J. W.; Brandt, E. V.; Bezuidenhoudt, B. C. B. and Ferreira, D.: *J. Chem. Soc., Perkin Trans. 1*, (8) 1049-1056 (1995).
- 481 Feuer, L.; Farkas, L.; Nogradi, M.; Strelisky, J.; Vermes, B. and Wolfner, A.: *Fr. Demande* 2,162,175 (1973); *Chem. Abstr.*, **80**, 26952p (1974).
- 482 Feuer, L.; Farkas, L.; Nogradi, M.; Strelisky, J.; Vermes, B. and Wolfner, A.: *Brit.* 1,374,925 (1974); *Chem. Abstr.*, **83**, 27916d (1975).
- 483 Feuer, L.; Farkas, L.; Nogradi, M.; Vermes, B.; Gottsegen, A. and Wolfner, A.: *Hung. Teljes* 8899 (1974); *Chem. Abstr.*, **82**, 125278w (1975).
- 484 Feuer, L.; Nogradi, M.; Gottsegen, A.; Vermes, B.; Strelisky, J.; Wolfner, A.; Farkas, L.; Antus, S. and Kovacs, M.: *Ger. Offen.* 2,166,458 (1974); *Chem. Abstr.*, **82**, 16704m (1975).
- 485 Feuer, L.; Nogradi, M.; Gottsegen, A.; Vermes, B.; Strelisky, J.; Wolfner, A.; Farkas, L.; Antus, S. and Kovacs, Mrs. Andras: *Hung. Teljes* 6072 (1973); *Chem. Abstr.*, **79**, 92007q (1973).
- 486 Feuer, L.; Nogradi, M.; Gottsegen, A.; Vermes, B.; Strelisky, J.; Wolfner, A.; Farkas, L.; Antus, S. and Toth, M. K.: *U.S.* 4,166,862 (1979); *Chem. Abstr.*, **92**, 6415k (1980).
- 487 Feuerstein, W. and Brass, K.: *Ber. Dtsch. Chem. Ges.*, **37**, 817-820 (1904).
- 488 Feuerstein, W. and Kostanecki, S.: *Ber. Dtsch. Chem. Ges.*, **32A**, 1024-1030 (1899).
- 489 Filho, R. B. and Gottlieb, O. R.: *Phytochemistry*, **10**, 2433-2450 (1971).
- 490 Finaru, A.; Cascaval, A.; Tudorache, E. and Prisecaru, M.: *Rev. Chim. (Bucharest)*, **50** (1) 8-12 (1999); *Chem. Abstr.*, **131**, 170145s (1999).
- 491 Finch, H.; Lunts, L. H. C.; Naylor, A. and Skidmore, I. F.: *Eur. Pat. Appl.* EP 219,350 (1987); *Chem. Abstr.*, **107**, 39365a (1987).
- 492 Finch, H.; Lunts, L. H. C.; Naylor, A.; Skidmore, I. F. and Campbell, I. B.: *U.S.* 4,853,381 (1989); *Chem. Abstr.*, **112**, 138733d (1990).
- 493 Finch, H.; Lunts, L. H. C.; Naylor, A.; Skidmore, I. F. and Campbell, I. B.: *Eur. Pat. Appl.* EP 223,410 (1987); *Chem. Abstr.*, **108**, 37371w (1988).
- 494 Finch, H.; Lunts, L. H. C.; Naylor, A.; Skidmore, I. F.; Campbell, I. B.; Middlemiss, D. and Willbe, C.: *Eur. Pat. Appl.* EP 220,054 (1987); *Chem. Abstr.*, **108**, 55893x (1988).
- 495 Finnie, A. A. and Hill, R. A.: *J. Chem. Res., Synop.* (3) 78-79, 873-894 (1987).
- 496 Finzi, F.: *Monatsh. Chem.*, **26**, 1119-1138 (1905).
- 497 Fischer, R.: *Arch. Pharm. Ber. Dtsch. Pharm. Ges.*, **275**, 516-526 (1937).
- 498 Fisons Ltd.: *Jpn. Kokai Tokkyo Koho* 80 79,338 (1980); *Chem. Abstr.*, **94**, 83776x (1981).
- 499 Fisons Pharmaceuticals Ltd.: *Neth. Appl.* 6,603,997 (1966); *Chem. Abstr.*, **67**, 100002d (1967).
- 500 Fisons, Ltd: *Fr. Demande* 2,091,991 (1972); *Chem. Abstr.*, **77**, 186604h (1972).
- 501 Fitzmaurice, C. and Lee, T. B.: *Brit.* 1,144,906 (1969); *Chem. Abstr.*, **71**, 91309n (1969).
- 502 Fodor, G. and Kovacs, O.: *J. Am. Chem. Soc.*, **71**, 1045-1048 (1949).
- 503 Fodor, G.; Beke, D. and Kovacs, O.: *Acta Chim. Acad. Sci. Hung.*, **1** (1) 149-162 (1951).
- 504 Fodor, G.; Kovacs, O. and Mecher, T.: *Acta Chim. Acad. Sci. Hung.*, **1**, 395-402 (1951).
- 505 Fontes, E.; Lee, W. K.; Heiney, P. A.; Nounesis, G.; Garland, C. W.; Riera, A.; McCauley, J. P. Jr. and Smith III, A. B.: *J. Chem. Phys.*, **92** (6) 3917-3929 (1990).



- 506 Ford, R. E.; Knowles, P.; Lunt, E.; Marshall, S. M.; Penrose, A. J.; Ramsden, C. A.; Summers, A. J. H.; Walker, J. L. and Wright, D. E.: *J. Med. Chem.*, **29** (4) 538-549 (1986).
- 507 Fosdick, L. S.; Faucher, O. and Urbach, K. F.: *J. Am. Chem. Soc.*, **68**, 840-843 (1946).
- 508 Fountain, K. R. and Pierschbacher, M.: *J. Org. Chem.*, **41**, 2039-2042 (1976).
- 509 Franck, B. and Baumann, G.: *Chem. Ber.*, **96**, 3209-3216 (1963).
- 510 Fredenhagen, A.; Kenny, P.; Kita, H.; Komura, H.; Naya, Y.; Nakanishi, K.; Nishiyama, K.; Sugiura, M. and Tamura, S.: *Pestic. Sci. Biotechnol., Proc. Int. Congr. Pestic. Chem.* 6th, 101-108 (1986) (*Pub.* **1987**); *Chem. Abstr.*, **107**, 215127k (1987).
- 511 Frederick Stearns & Co.: A. P. 1 680 055; *Chem. Zentralbl.*, **I**, 1048 (1928).
- 512 Frederick Stearns & Co.: *Chem. Zentralbl.*, **II**, 351 (1929).
- 513 Fresenius, P. v.: *Pharm. Zentralhalle Dtschl.*, **95** (12) 471-478 (1956).
- 514 Freudenberg, K.; Fikentscher, H. and Harder, M.: *Justus Liebigs Ann. Chem.*, **441**, 157-180 (1925).
- 515 Freudenberg, K.; Karimullah and Steinbrunn, G.: *Justus Liebigs Ann. Chem.*, **518**, 37-61 (1935).
- 516 Friedlaender, P. and Rüdte, H.: *Ber. Dtsch. Chem. Ges.*, **29**, 1751-1756 (1896).
- 517 Friedlaender, P. and Schnell, L. C.: *Ber. Dtsch. Chem. Ges.*, **30**, 2150-2155 (1897).
- 518 Fries, K. and Finck, G.: *Ber. Dtsch. Chem. Ges.*, **41**, 4271-4284 (1908).
- 519 Fries, K. and Pfaffendorf, W.: *Ber. Dtsch. Chem. Ges.*, **43**, 212-219 (1910).
- 520 Fries, K.; Hasselbach, A. and Schroder, L.: *Justus Liebigs Ann. Chem.*, **405**, 346-372 (1914).
- 521 Fuchigami, T.; Kandeel, Zaghloul El-Shahat and Nonaka, T.: *Bull. Chem. Soc. Jpn.*, **58** (8) 2441-2442 (1985).
- 522 Fujii, T.; Yoshifuji, S. and Ohba, M.: *Chem. Pharm. Bull.*, **26** (10) 3218-3222 (1978).
- 523 Fujimori, S.; Yamazaki, T.; Kanno, M.; Kawamura, M.; Ninomiya, K.; Tobe, A. and Nitta, K.: *Jpn. Kokai Tokkyo Koho JP 02,225,413* [90,225,413] (1990); *Chem. Abstr.*, **114**, 136082h (1991).
- 524 Fujimoto, H.; Morimoto, K.; Ando, K.; Yagihara, M. and Ishikawa, T.: *Jpn. Kokai Tokkyo Koho JP 63,264,752* [88,264,752] (1988); *Chem. Abstr.*, **111**, 67815y (1989).
- 525 Fujita, A.; Hayashi, T.; Arisawa, M.; Shimizu, M.; Morita, N.; Kikuchi, T. and Tezuka, Y.: *J. Nat. Prod.*, **51** (4) 708-712 (1988).
- 526 Fujita, I.; Murata, S.; Kozuki, T.; Irie, K. and Oohashi, N.: *Jpn. Kokai Tokkyo Koho JP 07 41,459* [95 41,459] (1995); *Chem. Abstr.*, **123**, 227818e (1995).
- 527 Fukui, K. and Matsumoto, T.: *Bull. Chem. Soc. Jpn.*, **36** (7) 806-809 (1963).
- 528 Fukui, K. and Matsumoto, T.: *Bull. Chem. Soc. Jpn.*, **38** (4) 612-616 (1965).
- 529 Fukui, K. and Matsumoto, T.: *Bull. Chem. Soc. Jpn.*, **38** (6) 887-893 (1965).
- 530 Fukui, K. and Matsumoto, T.: *J. Sci. Hiroshima Univ., Ser. A-II*, **28** (1) 47-55 (1964); *Chem. Abstr.*, **62**, 9097h (1965).
- 531 Fukui, K. and Matsumoto, T.: *Nippon Kagaku Zasshi*, **86** (10) 1079-1084 (1965); *Chem. Abstr.*, **65**, 13645e (1966).
- 532 Fukui, K.; Matsumoto, T. and Matsuzaki, S.: *Bull. Chem. Soc. Jpn.*, **37** (2) 265-267 (1964).
- 533 Fukui, K.; Matsumoto, T. and Nakamura, S.: *Bull. Chem. Soc. Jpn.*, **38** (7) 1168-1170 (1965).
- 534 Fukui, K.; Matsumoto, T.; Nakamura, S.; Nakayama, M. and Horie, T.: *Bull. Chem. Soc. Jpn.*, **41** (6) 1413-1417 (1968).
- 535 Fukui, K.; Matsumoto, T.; Nakamura, S.; Nakayama, M. and Horie, T.: *Experientia*, **24** (2) 108-109 (1968).
- 536 Fukui, K.; Nakayama, M.; Hatanaka, M.; Okamoto, T. and Kawase, Y.: *Bull. Chem. Soc. Jpn.*, **36**, 397-399 (1963).
- 537 Furlanetto, Richard W. and Kaiser, E. T.: *J. Am. Chem. Soc.*, **95**, 6786-6792 (1973).
- 538 Furuya, H.; Hayakawa, K. and Shimada, H.: *Jpn. Kokai Tokkyo Koho JP 02,204,091* [90,204,091] (1990); *Chem. Abstr.*, **114**, 92023h (1991).
- 539 Gao, Peng; Li, Qun; Wang, Shi Yu and Zhang, Pang: *Chin. Chem. Lett.*, **3** (7) 489-492 (1992).

- 540 Garazd, M. M.; Garazd, Ya. L.; Ogorodniichuk, A. S.; Shilin, V. V.; Turov, A. V. and Khilya, V. P.: *Chem. Nat. Compd.*, **34** (4) 442-447 (1998) (Pub. 1999); *Chem. Abstr.*, **131**, 214522u (1999).
- 541 Garazd, M. M.; Ogorodniichuk, A. S.; Shilin, V. V.; Vasil'ev, S. A.; Turov, A. V. and Khilya, V. P.: *Chem. Nat. Compd.*, **34** (4) 435-441 (1998) (Pub. 1999); *Chem. Abstr.*, **131**, 214098k (1999).
- 542 Garcia, H.; Martinez-Utrilla, R. and Miranda, M. A.: *Tetrahedron*, **41** (15) 3131-3134 (1985).
- 543 Garcia, H.; Martinez-Utrilla, R.; Miranda, M. A. and Roquet-Jalmar, M. F.: *J. Chem. Res., Synop.*, (12) 350-351 (1982).
- 544 Garcia, H.; Miranda, M. A. and Primo, J.: *J. Chem. Res., Synop.*, (3), 100-101 (1986).
- 545 Garcia, H.; Miranda, M. A.; Roquet-Jalmar, M. F. and Martinez-Utrilla, R.: *Liebigs Ann. Chem.*, **12**, 2238-2243 (1982).
- 546 Gardener, B. B. McSpadden; Schroeder, K. L.; Kalloger, S. E.; Raaijmakers, J. M.; Thomashow, L. S. and Weller, D. M.: *Appl. Environ. Microbiol.*, **66** (5) 1939-1946 (2000); *Chem. Abstr.*, **133**, 71306e (2000).
- 547 Gardner, P. D.: *J. Am. Chem. Soc.*, **77**, 4674-4675 (1955).
- 548 Gardner, T. S.; Wenis, E. and Lee, J.: *J. Org. Chem.*, **15**, 841-849 (1950).
- 549 Gauthier, S.; Caron, B.; Cloutier, J.; Dory, Y. L.; Favre, A.; Larouche, D.; Mailhot, J.; Ouellet, C.; Schwerdtfeger, A.; Leblanc, G.; Martel, C.; Simard, J.; Merand, Y.; Belanger, A.; Labrie, C. and Labrie, F.: *J. Med. Chem.*, **40** (14) 2117-2122 (1997).
- 550 Gaydou, E. M. and Bianchini, J. P.: *Ann. Chim. (Paris)*, **2** (6) 303-308 (1977); *Chem. Abstr.*, **88**, 136410h (1978).
- 551 Gazave, J. M.; Rancurel, A. and Grenier, G.: *Ger. Offen.* 2,501,443 (1975); *Chem. Abstr.*, **83**, 188522n (1975).
- 552 Geissler, J. F.; Roesel, J. L.; Meyer, T.; Trinks, U. P.; Traxler, P. and Lydon, N. B.: *Cancer Res.*, **52** (16) 4492-4498 (1992); *Chem. Abstr.*, **117**, 184410x (1992).
- 553 Geissman, T. A. and Harborne, J. B.: *J. Am. Chem. Soc.*, **78**, 832-837 (1956).
- 554 Geissman, T. A. and Mojé, W.: *J. Am. Chem. Soc.*, **73**, 5765-5768 (1951).
- 555 Gero, A.: *J. Org. Chem.*, **16**, 1222-1230 (1951).
- 556 Gevorgyan, G. A.; Gabrielyan, S. A.; Vlasenko, E. V.; Durgaryan, L. K.; and Mndzhoyan, O. L.: *Khim. Farm. Zh.*, **21** (4) 419-425 (1987); *Chem. Abstr.*, **107**, 127109a (1987).
- 557 Gevorgyan, G. A.; Gabrielyan, S. A.; Apoyan, N. A.; Podol'skaya, L. P.; Sukasyan, R. S.; Sarkisyan, A. S.; Azlivyan, A. S.; Akopyan, A. V. and Mndzhoyan, O. L.: *Khim. Farm. Zh.*, **23** (12) 1478-1480 (1989); *Chem. Abstr.*, **112**, 172258n (1990).
- 558 Ghisalberti, E. L.; Jefferies, P. R. and Stacey, C. I.: *Aust. J. Chem.*, **20** (5) 1049-1053 (1967).
- 559 Gilbert, A. H.; McGooking, A. and Robertson, A.: *J. Chem. Soc.*, 3740-3745 (1957).
- 560 Givens, R. S.; Jung, A.; Park, Chan-Ho; Weber, J. and Bartlett, W.: *J. Am. Chem. Soc.*, **119** (35) 8369-8370 (1997).
- 561 Gjertsen, F. B.; Solheim, E. and Scheline, R. R.: *Xenobiotica*, **18** (2) 225-234 (1988); *Chem. Abstr.*, **108**, 160851e (1988).
- 562 Godden, B.; Ball, A. S.; Helvenstein, P.; McCarthy, A. J. and Penninckx, M. J.: *J. Gen. Microbiol.*, **138** (11) 2441-2448 (1992); *Chem. Abstr.*, **118**, 120635n (1993).
- 563 Goel, R. N.; Jain, A. C. and Seshadri, T. R.: *J. Chem. Soc.*, 1369-1371 (1956).
- 564 Goldberg, A. A. and Turner, H. S.: *J. Chem. Soc.*, 111-113 (1946).
- 565 Goldschmidt, C.: *Chem. Ztg.*, **27**, 246 (1903).
- 566 Goldsworthy, L. J. and Robinson, R.: *J. Chem. Soc.*, 46-49 (1937).
- 567 Golub, A. A.; Antoshchuk, V. V. and Kapshuk, A. A.: *Ukr. Khim. Zh.*, **60** (9-10) 606-609 (1994); *Chem. Abstr.*, **124**, 116727a (1996).
- 568 Golubev, N. S. and Denisov, G. S.: *Dokl. Akad. Nauk SSSR*, **220** (6) 1352-1355 (1975); *Chem. Abstr.*, **82**, 139157t (1975).
- 569 Gong, S. S.; Liu, C. D.; Liu, S. L.; Du, Y. R.; Kang, W. and Dong, X. Q.: *Yaoxue Xuebao*, **23** (4) 276-280 (1988); *Chem. Abstr.*, **109**, 79560h (1988).
- 570 Goni, M. A. and Hedges, J. I.: *Geochim. Cosmochim. Acta*, **56** (11) 4025-4043 (1992); *Chem. Abstr.*, **118**, 258334v (1993).
- 571 Gonzalez, A. G.; Barrera, J. B. and Yanes, H. C.: *Heterocycles*, **34** (7) 1311-1315 (1992).

- 572 Goodwin, B. L.; Ruthven, C. R. J. and Sandler, M.: *Gen. Pharmacol.*, **28** (4) 535-543 (1997); *Chem. Abstr.*, **126**, 328527b (1997).
- 573 Gopinath, K. W.; Kidwai, A. R. and Prakash, L.: *Tetrahedron*, **16**, 201-205 (1961).
- 574 Gormley, T. R. and O'Sullivan, W. I.: *Tetrahedron*, **29** (2) 369-373 (1973).
- 575 Gorter, K.: *Arch. Pharm. Ber. Dtsch. Pharm. Ges.*, **244**, 401-405 (1906).
- 576 Göschke, A. and Tambor, J.: *Ber. Dtsch. Chem. Ges.*, **45**, 1237-1239 (1912).
- 577 Goskonda, V. R.; Khan, M. A.; Hutaik, C. M. and Reddy, I. K.: *J. Pharm. Sci.*, **88** (2) 180-184 (1999); *Chem. Abstr.*, **130**, 232443c (1999).
- 578 Goto, T.: *J. Pharm. Soc. Jpn.*, **74**, 318-319 (1954); *Chem. Abstr.* **49**, 3960c (1955).
- 579 Gould, K. J.; Manners, C. N.; Payling, D. W.; Suschitzky, J. L. and Wells, E.: *J. Med. Chem.*, **31** (7) 1445-1453 (1988).
- 580 Goupil, J. J.: *Belg.* 871,424 (1979); *Chem. Abstr.*, **91**, 39455f (1979).
- 581 Goupil, J. J.: *Can. CA* 1,130,302 (1982); *Chem. Abstr.*, **98**, 16667g (1983).
- 582 Govindachari, T. R.; Nagarajan, K. and Parthasarathy, P. C.: *J. Chem. Soc.*, 548-551 (1957).
- 583 Govindachari, T. R.; Nagarajan, K. and Parthasarathy, P. C.: *Tetrahedron*, **15** (1-4) 129-131 (1961).
- 584 Govori, S.; Rapic, V.; Leci, O.; Cacic, M. and Tabakovic, I.: *J. Heterocycl. Chem.*, **33** (2) 351-354 (1996).
- 585 Gowan, J. E.; Lynch, M. F.; O'Connor, N. S.; Philbin, E. M. and Wheeler, T. S.: *J. Chem. Soc.*, 2495-2499 (1958).
- 586 Grady, R. W.; Bienen, E. J. and Clarkson, A. B., Jr., *Mol. Biochem. Parasitol.*, **21** (1) 55-63 (1986); *Chem. Abstr.*, **106**, 171p (1987).
- 587 Gramatica, P.; Gianotti, M. P.; Speranza, G. and Manitto, P.: *Heterocycles*, **24** (3) 743-750 (1986).
- 588 Grinsteins, V. and Adakovskii, Ya. A.: *Latv. PSR Zinat. Akad. Vestis, Kim. Ser.*, **5**, 593-596 (1968); *Chem. Abstr.*, **70**, 57586v (1969).
- 589 Grouiller, A. and Pacheco, H.: *Bull. Soc. Chim. Fr.*, 4981-4985 (1968).
- 590 Grover, P. K. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **38A** (2) 122-127 (1953).
- 591 Grover, S. K. and Seshadri, T. R.: *Indian J. Chem.*, **4** (6) 290-291 (1966).
- 592 Grover, S. K.; Gupta, V. N.; Jain, A. C. and Seshadri, T. R.: *J. Sci. Ind. Res.*, **19B** (7) 258-264 (1960).
- 593 Grover, S. K.; Jain, A. C. and Seshadri, T. R.: *Indian J. Chem.*, **1** (10) 429-431 (1963).
- 594 Grover, S. K.; Jain, A. C. and Seshadri, T. R.: *J. Indian Chem. Soc.*, **39** (5) 301-305 (1962).
- 595 Grover, S. K.; Jain, A. C. and Seshadri, T. R.: *Tetrahedron*, **20** (3) 555-564 (1964).
- 596 Gruber, W. and Horvath, K.: *Monatsch. Chem.*, **80**, 563-571 (1949).
- 597 Gu, Jian-Xin; Li, Zu-Yi and Lin, Guo-Qiang: *Chin. J. Chem.*, **13** (5) 475-480 (1995); *Chem. Abstr.*, **124**, 84947d (1996).
- 598 Gulati, K. C. and Venkataraman, K.: *J. Chem. Soc.*, 2376-2381 (1931).
- 599 Gulati, K. C.; Seth, S. R. and Venkataraman, K.: *Org. Synth. Coll. Vol. II*, 522 (1943).
- 600 Gupta, S. R. and Seshadri, T. R.: *J. Chem. Soc.*, 3063-3065 (1954).
- 601 Gupta, S. R.; Malik, K. K. and Seshadri, T. R.: *Indian J. Chem.*, **6** (9) 481-484 (1968).
- 602 Gurjar, M. K.; Joshi, S. V.; Sastry, B. S. and Rao, A. V. R.: *Synth. Commun.*, **20** (22) 3489-3496 (1990).
- 603 Guy, A.; Lemaire, M. and Guetté, J. P.: *Synthesis*, (12) 1018-1020 (1982).
- 604 Hakimelahi, G. H. and Moshfegh, A. A.: *Helv. Chim. Acta*, **64** (2) 599-609 (1981).
- 605 Hamed, A. A.; Salem, M. A. I.; Hataba, A. M. and Attia, I. A.: *Pol. J. Chem.*, **59** (10-12) 1161-1166 (1986); *Chem. Abstr.*, **107**, 39251k (1987).
- 606 Hameed, S.; Saify, Z. S.; Vaid, H. M. Fayyaz; Saeed, M.; Ahmed, M. and Khan, A.: *J. Sci., Islamic Repub. Iran*, **4** (4) 281-284 (1993); *Chem. Abstr.*, **122**, 105611r (1995).
- 607 Hammon, A.: *Eur. Pat. Appl. EP* 375,457 (1990); *Chem. Abstr.*, **114**, 42774h (1991).
- 608 Hanaya, K.; Muramatsu, T. and Hasegawa, E.: *Chem. Ind. (London)*, **23**, 802-803 (1990).
- 609 Hanaya, K.; Muramatsu, T.; Izawa, O.; Youkouchi, A. and Hasegawa, E.: *Nippon Kagaku Kaishi*, **4**, 363-369 (1993); *Chem. Abstr.*, **119**, 139000v (1993).
- 610 Hänsel, R. and Ohlendorf, D.: *Tetrahedron Lett.*, (6) 431-432 (1969).

- 611 Hänsel, R.; Rimpler, H. and Schwarz, R.: *Tetrahedron Lett.*, (8) 735-738 (1967).  
612 Hansen, H. L.: *J. Am. Chem. Soc.*, **59**, 280-281 (1937).  
613 Hara, H.; Igarashi, S.; Kimura, T.; Isaka, M.; Naito, R.; Nagaoka, H.; Koutoku, H.; Tomioka, K. and Mase, T.: *PCT Int. Appl. WO 93 24,442* (1993); *Chem. Abstr.*, **121**, 280384v (1994).  
614 Hariramakrishnan, K.; Gandhidasan, R. and Raman, P. V.: *Indian J. Heterocycl. Chem.*, **1** (3) 98 (1991).  
615 Harper, S. H.; Shirley, D. B. and Taylor, D. A.: *Phytochemistry*, **15** (6) 1019-1023 (1976).  
616 Harvey, C. M.; Sargent, C. and Siegl, P. K. S.: *PCT Int. Appl. WO 96 09,818* (1996); *Chem. Abstr.*, **125**, 114587b (1996).  
617 Harwood, H. J. and Goodrich, S. D.: *U.S. US 5,405,913* (1995); *Chem. Abstr.*, **123**, 170528d (1995).  
618 Hasegawa, Y.; Shinto, S.; Hattori, T.; Ohata, T.; Aga, Aru; Bae, Ho-Rin and Yang, Ka: *Jpn. Kokai Tokkyo Koho JP 10 273,464 [98 273,464]* (1997); *Chem. Abstr.*, **129**, 339873z (1998).  
619 Hauteville, M. and Chadenson, M.: *Bull. Soc. Chim. Fr.*, **5** (Pt. 2) 1780 (1973).  
620 Haworth, R. D.; Mavin, C. R. and Sheldrick, G.: *J. Chem. Soc.*, 1423-1429 (1934).  
621 Hayashi, Y. and Kouji, H.: *J. Agric. Food Chem.*, **38** (3) 845-850 (1990).  
622 Hayashi, Y.: *J. Agric. Food Chem.*, **38** (3) 839-844 (1990).  
623 He, Yuehua; Groleau, S.; C.-Gaudreault, R.; Caron, M.; Therien, H.-M. and Berube, G.: *Bioorg. Med. Chem. Lett.*, **5** (19) 2217-2222 (1995).  
624 Heacock, R. A. and Huntzinger, O.: *Can. J. Chem.*, **43** (9) 2535-2544 (1965).  
625 Healey, M. and Robinson, R.: *J. Chem. Soc.*, 1625-1631 (1934).  
626 Heap, T. and Robinson, R.: *J. Chem. Soc.*, 2336-2344 (1926).  
627 Heilbron, I. M.; Hey, D. H. and Lythgoe, B.: *J. Chem. Soc.*, 295-300 (1936).  
628 Heller, G.: *Ber. Dtsch. Chem. Ges.*, **42**, 2736-2742 (1909).  
629 Heller, G.: *Ber. Dtsch. Chem. Ges.*, **45**, 418-427 (1912).  
630 Heller, G.: *Ber. Dtsch. Chem. Ges.*, **45**, 2389-2392 (1912).  
631 Hemalatha, G.; Merina, A. J.; Venkataraman, V. R. and Nagarajan, S.: *Asian J. Chem.*, **3** (3) 342-343 (1991); *Chem. Abstr.*, **117**, 61443c (1992).  
632 Henning, H. G.; Schwabe, B. and Westphal, G.: *Z. Chem.*, **24** (2) 58-60 (1984).  
633 Henning, H. G.; Schwabe, B.; Kernchen, F. and Westphal, G.: *J. Prakt. Chem.*, **326** (3) 491-501 (1984).  
634 Henrick, C. A. and Jefferies, P. R.: *Aust. J. Chem.*, **17**, 934-942 (1964).  
635 Herron, D. K.; Goodson, T.; Bollinger, N. G.; Swanson-Bean, D.; Wright, I. G.; Staten, G. S.; Thompson, A. R.; Froelich, L. L. and Jackson, W. L.: *J. Med. Chem.*, **35** (10) 1818-1928 (1992).  
636 Herzig, J. and Hofmann, B.: *Ber. Dtsch. Chem. Ges.*, **42**, 155-159 (1909).  
637 Herzig, J. and Smoluchowski, T.: *Monatsh. Chem.*, **14**, 39-52 (1893).  
638 Herzig, J.: *Monatsh. Chem.*, **12**, 177-190 (1891).  
639 Herzig, J.: *Monatsh. Chem.*, **20**, 461-466 (1899).  
640 Hess, K. M.; Dudley, M. W.; Lynn, D. G.; Joerger, R. D. and Binns, A. N.: *Proc. Natl. Acad. Sci. U. S.A.*, **88** (17) 7854-7858 (1991).  
641 Hill, P. and Short, W. F.: *J. Chem. Soc.*, 1123-1126 (1935).  
642 Hodgetts, K. J.; Maragkou, K. I.; Wallace, T. W. and Wootton, R. C. R.: *Tetrahedron*, **57** (31) 6793-6804 (2001).  
643 Hoffmann-La Roche & Co., A.-G.: *Swiss 263,801* (1949); *Chem. Abstr.*, **44**, 5910d (1950).  
644 Holland, J. A. and Johnson, D. K.: *U.S. US 5,902,831* (1999); *Chem. Abstr.*, **130**, 332896w (1999).  
645 Hopkins, T. L.; Starkey, S. R.; Xu, R.; Merritt, M. E.; Schaefer, J. and Kramer, K. J.: *Insect Biochem. Physiol.*, **40** (3) 119-128 (1999); *Chem. Abstr.*, **131**, 42233g (1999).  
646 Hopper, J. W.; Marlow, W.; Whalley, W. B.; Bortwick, A. D. and Bowden, R.: *J. Chem. Soc. C*, (12) 3580-3590 (1971).  
647 Horie, T.; Kawamura, Y.; Tsukayama, M. and Yoshizaki, S.: *Chem. Pharm. Bull.*, **37** (5) 1216-1220 (1989).

- 648 Horie, T.; Shibata, K.; Yamashita, K.; Kawamura, Y. and Tsukayama, M.: *Chem. Pharm. Bull.*, **45** (3) 446-451 (1997).
- 649 Horie, T.; Tsukayama, M.; Kawamura, Y. and Seno, M.: *J. Org. Chem.*, **52** (21) 4702-4709 (1987).
- 650 Horie, T.; Tsukayama, M.; Kawamura, Y. and Yamamoto, S.: *Chem. Pharm. Bull.*, **35** (11) 4465-4472 (1987).
- 651 Horowitz, R. M. and Gentili, B.: *J. Org. Chem.*, **26**, 2899-2902 (1961).
- 652 Horton, W. J. and Stout, M. G.: *J. Org. Chem.*, **27**, 830-833 (1962).
- 653 Horvath, K.: *Monatsh. Chem.*, **82**, 901-912 (1951).
- 654 Hosoya, S.; Kanazawa, K.; Kaneko, H. and Nakano, J.: *Mokuzai Gakkaishi*, **26** (2) 118-121 (1980); *Chem. Abstr.*, **93**, 74113f (1980).
- 655 Houben, J. and Fischer, W.: *Ber. Dtsch. Chem. Ges.*, **63**, 2455-2463 (1930).
- 656 Houben, J. and Fischer, W.: *J. Prakt. Chem.*, **123**, 262-275 (1929).
- 657 Houben, J.: *Ber. Dtsch. Chem. Ges.*, **63**, 2455-2463 (1930).
- 658 Howe, R.; Rao, B. S. and Heyneker, H.: *J. Chem. Soc. C*, 2510-2514 (1967).
- 659 Huang, F.; Galemno, R. A., Jr. and Campbell, H. F.: U.S. US 4,920,131 (1990); *Chem. Abstr.*, **116**, 106117x (1992).
- 660 Huang, Pao-Lin; Lu, Chai-Ming; Yen, Ming-Hong; Wu, Ru-Rong and Lin, Chun-Nan: *Phytochemistry*, **40** (2) 537-541 (1995).
- 661 Huang, Pao-Lin; Won, Shen-Jeu; Day, Shiow-Hwa and Lin, Chun-Nan: *Helv. Chim. Acta*, **82** (10) 1716-1720 (1999).
- 662 Hubert-Habart, M.; Menichi, G.; Takagi, K.; Cheutin, A.; Desvoye, M. L. and Royer, R.: *Chim. Ther.*, **3** (4) 280-288 (1968).
- 663 Hudson, J. C.; Golin, M. and Malcom, M.: *J.-Can. Soc. Forensic Sci.*, **28** (2) 137-152 (Pub. 1995) (1995); *Chem. Abstr.*, **123**, 190633 (1995).
- 664 Huebner, C. F. and Link, K. P.: *J. Am. Chem. Soc.*, **67**, 99-101 (1945).
- 665 Huhta, Soini Kanerva and Koskenniska, Lasse Antero: *Finn.* 58,491 (1980); *Chem. Abstr.*, **94**, 208529c (1981).
- 666 Huke, M.; Goerlitzer, K. and Schenck, G.: *Arch. Pharm.(Weinheim, Ger.)*, **302** (6) 401-422 (1969).
- 667 Hussain, A. A. and Truelove, J. E.: U.S. 3,868,461 (1975); *Chem. Abstr.*, **82**, 139675k (1975).
- 668 Hwang, Bang Yeon; Kim, Young Ho; Ro, Jai Seup; Lee, Kyong Soon and Lee, Jung Joorn: *Arch. Pharmacol. Res.*, **22** (1) 72-74 (1999).
- 669 Ibrahim, S. S.; Abdel-Halim, A.; Gabr, Y. and Hassan, A. M.: *J. Chem. Soc. Pak.*, **18** (3) 226-232 (1996); *Chem. Abstr.*, **126**, 31251g (1997).
- 670 Ichikawa, M.; Pamukcu, A. M. and Bryan, G. T.: *Org. Prep. Proced. Int.*, **14** (3) 183-187 (1982); **96**, 162389t (1982).
- 671 ICI Australia Ltd.: *Brit.* 1,569,819 (1980); *Chem. Abstr.*, **94**, 30350x (1981).
- 672 Iengar, R.; Mehta, A. C.; Seshadri, T. R. and Varadarajan, S.: *J. Sci. Ind. Res.*, **13B** (3) 166-174 (1954).
- 673 Iiyama, K. and Lam Thi Bach Tuyet: *J. Sci. Food Agric.*, **51** (4) 481-491 (1990); *Chem. Abstr.*, **113**, 113960h (1990).
- 674 Ikeda, M.; Sakai, T.; Tsuai, S.; Zuao, I.; Ryan, H.; Iyan, S.; Kai, Y.; Kako, Y.; Tsukada, I. and Yanagisawa, M.: *Jpn. Kokai Tokkyo Koho JP 08,268,890* [96,268,890] (1996); *Chem. Abstr.*, **126**, 74678u (1997).
- 675 Ikemoto, T. and Yamashita, Y.: *Jpn. Kokai Tokkyo Koho JP 04,255,798* [92,255,798] (1992); *Chem. Abstr.*, **118**, 27301z (1993).
- 676 Ingle, T. R.; Phalnikar, N. L. and Bhide, B. V.: *J. Indian Chem. Soc.*, **26** (12) 569-574 (1949).
- 677 Iradian, M. A.; Aroyan, R. A.; Yengoyan, A. P.; Grigorian, G. Kh.; Nersessian, S. E. and Panossian, A. G.: *Khim. Farm. Zh.*, **28** (7) 13-15 (1994); *Chem. Abstr.*, **122**, 81220j (1995).
- 678 Ishida, K.; Enomoto, M.; Fujita, S. and Oka, H.: *PCT Int. Appl. WO 96 25, 386* (1996); *Chem. Abstr.*, **125**, 212679c (1996).
- 679 Ishikawa, Wataru and Kurosawa, Hideichi: *J. Chem. Soc. Jpn.*, **63**, 1265-1267 (1942).

- 680 Ishitsuka, H.; Shirai, H.; Umeda, I. and Suhara, Y.: Eur. Pat. Appl. 19,081 (1980); Chem. Abstr., **95**, 7066w (1981).
- 681 Ishwar-Dass; Narasimhachari, N. and Seshadri, T. R.: Proc. Indian Acad. Sci., **37A** (5) 599-610 (1953).
- 682 Iso, Y.; Shindo, H. and Hamana, H.: Tetrahedron, **56** (30) 5353-5361 (2000).
- 683 Israelstam, S. S. and Stephen, H.: J. S. African Chem. Inst., **26**, 41-48 (1943).
- 684 Israelstam, S. S.: J. S. African Chem. Inst., **26**, 49-53 (1943).
- 685 Itoh, H.; Konno, M.; Tokuhira, T.; Iguchi, S. and Hayashi, M.: Brit. UK Pat. Appl. 2,026,480 (1980); Chem. Abstr., **93**, 167893a (1980).
- 686 Iyer, R. N.; Shah, K. H. and Venkataraman, K.: Proc. Indian Acad. Sci., Sect. A, **33A**, 116-126 (1951).
- 687 Iyer, R. N.; Shah, K. H. and Venkataraman, K.: Proc. Indian Acad. Sci., Sect. A, **33A**, 228-230 (1951).
- 688 Iyer, R. N.; Shah, K. H. and Venkataraman, K.: Curr. Sci., **18**, 404-406 (1949); Chem. Abstr., **44**, 3988e (1950).
- 689 Izawa, T.; Nishiyama, S. and Yamamura, S.: Tetrahedron, **50** (48) 13593-13600 (1994).
- 690 Jadhav, G. V. and Merchant, J. R.: J. Indian Chem. Soc., **28** (5) 265-267 (1951).
- 691 Jadhav, G. V. and Merchant, J. R.: J. Indian Chem. Soc., **29** (7) 403-404 (1951).
- 692 Jadhav, G. V. and Merchant, J. R.: J. Univ. Bombay, Sci., **19** (5) 41-44 (1951); Chem. Abstr., **46**, 9073f (1952).
- 693 Jadhav, G. V. and Merchant, J. R.: J. Univ. Bombay, Sci., **19** (5) 45-46 (1951); Chem. Abstr., **47**, 6375h (1953).
- 694 Jadhav, G. V. and Merchant, J. R.: J. Univ. Bombay, Sci., **19** (5), 35-38 (1951); Chem. Abstr., **46**, 8630a (1952).
- 695 Jadhav, G. V. and Merchant, J. R.: J. Univ. Bombay, Sci., **19** (5), 39-40 (1951); Chem. Abstr., **46**, 8630e (1952).
- 696 Jadhav, G. V. and Merchant, J. R.: Proc. Indian Acad. Sci., Ser. A, **34A** (3) 152-154 (1951).
- 697 Jain, A. C. and Arya, P.: Indian J. Chem., Sect., B: **24B** (10) 1015-1022 (1985).
- 698 Jain, A. C. and Bambah, P. K.: Indian J. Chem., Sect. B, **25B** (6) 649-651 (1986).
- 699 Jain, A. C. and Bambah, P. K.: Indian J. Chem., Sect. B, **26B** (7) 628-633 (1987).
- 700 Jain, A. C. and Jain, S. M.: Tetrahedron, **29** (18) 2803-2806 (1973).
- 701 Jain, A. C. and Mehta, A.: J. Chem. Soc., Perkin Trans. 1, (2) 215-220 (1986).
- 702 Jain, A. C. and Nayyar, N. K.: Indian J. Chem., Sect. B, **25B** (5) 481-484 (1986).
- 703 Jain, A. C. and Nayyar, N. K.: Indian J. Chem., Sect. B, **26B** (2) 136-139 (1987).
- 704 Jain, A. C. and Paliwal, Poonam: Indian J. Chem., Sect. B: **27B** (12) 1146-1147 (1988).
- 705 Jain, A. C. and Paliwal, Poonam: Indian J. Chem., Sect. B: **27B** (11) 985-988 (1988).
- 706 Jain, A. C. and Prasad, A. K.: Indian J. Chem., Sect. B, **26B** (12) 1143-1147 (1987).
- 707 Jain, A. C. and Prasad, A. K.: Indian J. Chem., Sect. B, **27B** (7) 622-624 (1988).
- 708 Jain, A. C. and Seshadri, T. R.: J. Sci. Ind. Res., **13B** (8) 539-544 (1954).
- 709 Jain, A. C. and Seshadri, T. R.: Proc. Indian Acad. Sci., Sect. A, **40A** (6) 249-259 (1954).
- 710 Jain, A. C. and Sharma, A.: J. Chem. Soc., Chem. Commun., (6) 338-339 (1985).
- 711 Jain, A. C. and Tyagi, O. D.: Indian J. Chem., Sect. B, **27B** (2) 112-116 (1988).
- 712 Jain, A. C.; Arya, P. and Gupta, S. M., Indian J. Chem., Sect. B, **24B** (4) 383-388 (1985).
- 713 Jain, A. C.; Arya, P. and Nayyar, N. K.: Indian J. Chem., Sect. B, **23B** (11) 1030-1035 (1984).
- 714 Jain, A. C.; Jain, S. M. and Seshadri, T. R.: Indian J. Chem., **10** (6) 581-584 (1972).
- 715 Jain, A. C.; Jain, S. M. and Singh, J.: Tetrahedron, **30** (15) 2485-2492 (1974).
- 716 Jain, A. C.; Kumar, A. and Gupta, R. C.: J. Chem. Soc., Perkin Trans. 1, (1) 279-280 (1979).
- 717 Jain, A. C.; Lal, P. and Seshadri, T. R.: Indian J. Chem., **6** (8) 485-487 (1968).
- 718 Jain, A. C.; Nayyar, N. K. and Arya, P.: Indian J. Chem., Sect. B, **25B** (6) 646-648 (1986).
- 719 Jain, A. C.; Nayyar, N. K. and Gupta, A.: Indian J. Chem., Sect. B, **24B** (11) 1133-1136 (1985).
- 720 Jain, A. C.; Nayyar, N. K. and Paliwal, P.: Indian J. Chem., Sect. B, **28B** (1) 10-14 (1989).
- 721 Jain, A. C.; Seshadri, T. R. and Sreenivasan, K. R.: J. Chem. Soc., 3908-3910 (1955).

- 722 Jain, A. C.; Shrivastava, R. and Tyagi, O. D.: *Indian J. Chem., Sect. B*: **27B** (7) 625-628 (1988).
- 723 Jain, A. C.; Tyagi, O. D. and Prasad, A. K.: *Proc. Indian Acad. Sci., Chem. Sci.*, **100** (1) 45-52 (1988).
- 724 Jain, P. K.; Pinkey; Makrandi, J. K. and Grover, S. K.: *Indian J. Chem., Sect. B*: **24B** (1) 51-58 (1985).
- 725 Jain, P.; Chaturvedi, K. K. and Katyal, M.: *Acta Cienc. Indica*, **4** (3) 252-253 (1978); *Chem. Abstr.*, **90**, 210988n (1979).
- 726 Jain, S. C.; Talwar, S.; Bhagat, S.; Rajwanshi, V. K.; Kumar, R. and Babu, B. R.: *Pure Appl. Chem.*, **68** (3) 739-742 (1996); *Chem. Abstr.*, **125**, 58150q (1996).
- 727 Jakobsen, P.; Treppendahl, S.; Andersen, P. H.; Klysner, R.; Geisler, A. and Teuber, L.: *J. Med. Chem.*, **28** (12) 1962-1964 (1985).
- 728 Jefferies, P. R.; Knox, J. R. and Middleton, E. J.: *Aust. J. Chem.*, **15**, 532-537 (1962).
- 729 Jemison, R. W.: *Aust. J. Chem.*, **21** (1) 217-220 (1968).
- 730 Jerzmanowska, Z. and Michalska, M.: *Rocz. Chem.*, **35**, 353-357 (1961).
- 731 Jha, H. C.; Zilliken, F. and Breitmaier, E.: *Angew. Chem.*, **93** (1) 129-130 (1981).
- 732 Jha, H. C.; Zilliken, F.; Offermann, W. and Breitmaier, E.: *Can. J. Chem.*, **59** (15) 2266-2282 (1981).
- 733 Jha, O. P.: *J. Indian Chem. Soc.*, **50** (11) 740-742 (1973).
- 734 Jhaveri, D. B.; Thakor, V. M. and Naik, H. B.: *Vidya*, **B 19** (2) 149-152 (1976); *Chem. Abstr.*, **87**, 201001w (1977).
- 735 Ji, Q. E. and Wei, Y. L.: *Yaoxue Xuebao*, **24** (12) 906-912 (1989); *Chem. Abstr.*, **113**, 58841t (1990).
- 736 Joglekar, S. J. and Samant, S. D.: *Synthesis*, (10), 830-832 (1988).
- 737 John, H. and Beetz, P.: *J. Prakt. Chem.*, **149**, 171-174 (1937).
- 738 Johnson, T. B. and Gatewood, E.: *J. Am. Chem. Soc.*, **51**, 1815-1819 (1929).
- 739 Jones, G. H.; Mackenzie, J. B. D.; Robertson, A. and Whalley, W. B.: *J. Chem. Soc.*, 562-569 (1949).
- 740 Joshi, K. C. and Bahel, S. C.: *J. Indian Chem. Soc.*, **37** (11) 687-689 (1960).
- 741 Joshi, K. C. and Gupta, Jharna Sen: *J. Indian Chem. Soc.*, **40** (10) 851-856 (1963).
- 742 Joshi, K. C. and Jauhar, A. K.: *Indian J. Chem.*, **3** (8) 358-360 (1965).
- 743 Joshi, P. C. and Venkataraman, K.: *J. Chem. Soc.*, 513-514 (1934).
- 744 Jurd, L.; Stevens, K. and Manners, G.: *Phytochemistry*, **11** (8) 2535-2540 (1972).
- 745 Kaegi, B.; Kormany, G. and Luethi, C.: *Ger. Offen.* 2,839,595 (1979); *Chem. Abstr.*, **91**, 6410j (1979).
- 746 Kagal, S. A.; Karmarkar, S. S. and Venkataraman, K.: *Proc. Indian Acad. Sci., Sect. A*: **44A** (1) 36-41 (1956).
- 747 Kagal, S. A.; Nair, P. M. and Venkataraman, K.: *Tetrahedron Lett.*, **14**, 593-597 (1962).
- 748 Kajigaeshi, S.; Kakinami, T.; Moriwaki, M.; Fujisaki, S.; Maeno, K. and Okamoto, T.: *Synthesis*, 545-546 (1988).
- 749 Kalla, A. K.; Dhar, K. L. and Atal, C. K.: *Indian J. Chem., Sect. B*: **15B** (3) 258-259 (1977).
- 750 Kalra, V. K.; Kukla, A. S. and Seshadri, T. R.: *Indian J. Chem.*, **4** (4) 201 (1966).
- 751 Kalra, V. K.; Kukla, A. S. and Seshadri, T. R.: *Indian J. Chem.*, **5** (7) 287-290 (1967).
- 752 Kalra, V. K.; Kukla, A. S. and Seshadri, T. R.: *Indian J. Chem.*, **5**, 607-609 (1967).
- 753 Kalra, V. K.; Kukla, A. S. and Seshadri, T. R.: *Tetrahedron Lett.*, **23**, 2153-2154 (1967).
- 754 Kalra, V. K.; Kukla, A. S. and Seshadri, T. R.: *Tetrahedron*, **23** (7) 3221-3225 (1967).
- 755 Kaltenbronn, J. S.; Quin, J., III; Reisdorph, B. R.; Klutchko, S.; Reynolds, E. E.; Welch, K. M.; Flynn, M. A. and Doherty, A. M.: *Eur. J. Med. Chem.*, **32** (5) 425-431 (1997).
- 756 Kaltwasser, H.; Kochmann, W.; Pallas, M.; Damm, H. and Krueger, H.: *Ger. (East)* 71,245 (1970); *Chem. Abstr.*, **73**, 86830n (1970).
- 757 Kamaya, Y. and Higuchi, T.: *Mokuzai Gakkaishi*, **30** (3) 237-239 (1984); *Chem. Abstr.*, **101**, 3663h (1984).
- 758 Kametani, T.; Ohkubo, K. and Takano, S.: *Yakugaku Zasshi*, **89** (8) 1048-1055 (1969); *Chem. Abstr.*, **72**, 3472c (1970).
- 759 Kametani, T.; Ohkubo, K.; Noguchi, I. and Manske, R. H. F.: *Tetrahedron Lett.*, **38**, 3345-3349 (1965).

- 760 Kamezawa, M.; Kohara, K. and Tachibana, H.: *Nippon Kagaku Kaishi*, **1**, 138-140 (1985); *Chem. Abstr.*, **103**, 53919h (1985).
- 761 Kanakalakshmi, B. and Sethna, S.: *J. Indian Chem. Soc.*, **46** (5) 444-450 (1969).
- 762 Kapil, R. S.; Durani, S.; Dhar, J. and Setty, B. S.: *Indian IN* 173,337 (1994); *Chem. Abstr.*, **124**, 343113r (1996).
- 763 Kapil, R. S.; Durani, S.; Dhar, J. D. and Setty, B. S.: *Eur. Pat. Appl. EP* 470,310 (1992); *Chem. Abstr.*, **117**, 90146p (1992).
- 764 Karmarkar, S. S.: *J. Sci. Ind. Res.*, **20B**, 334-338 (1961);
- 765 Karmarkar, S. S.; Shah, K. H. and Venkataraman, K.: *Proc. Indian Acad. Sci.*, **37A**, 660-663 (1953).
- 766 Karmarkar, S. S.; Shah, K. H. and Venkataraman, K.: *Proc. Indian Acad. Sci.*, **41A**, 192-201 (1955).
- 767 Karmarkar, S. S.; Shah, K. H. and Venkataraman, K.: *Proc. Indian Acad. Sci., Sect. A*; **36A** (6) 552-558 (1952).
- 768 Karrer, P. and Biedermann, H.: *Helv. Chim. Acta*, **10**, 441 (1927).
- 769 Karrer, W.: *Helv. Chim. Acta*, **17**, 1560-1565 (1934).
- 770 Kasuya, K.; Yamazaki, N.; Nakane, H.; Hashimoto, M.; Koibuchi, S. and Hashimoto, M.: *Jpn. Kokai Tokkyo Koho JP* 11 24,250 [99 24,250] (1999); *Chem. Abstr.*, **130**, 160677g (1999).
- 771 Katamna, C.: *Bull. Soc. Chim. Fr.*, 2309-2322 (1970).
- 772 Kauffmann, H. and Grombach, A.: *Justus Liebigs Ann. Chem.*, **344**, 30-77 (1906).
- 773 Kawabe, Y.; Sakaguchi, S. and Kokubo, T.: *Jpn. Kokai Tokkyo Koho JP* 04,296,755 [92,296,755] (1992); *Chem. Abstr.*, **118**, 202100y (1993).
- 774 Kawabe, Y.; Uenishi, K. and Tan, S.: *Eur. Pat. Appl. EP* 445,819 (1991); *Chem. Abstr.*, **116**, 140130f (1992).
- 775 Kawai, S.; Umezawa, T.; Shimada, M.; Higuchi, T.; Koide, K.; Nishida, T.; Morohoshi, N. and Haraguchi, T.: *Mokuzai Gakkaishi*, **33** (10) 792-797 (1987); *Chem. Abstr.*, **108**, 58138r (1988).
- 776 Kawai, T.; Shimizu, T. and Chiba, H.: *J. Pharm. Soc. Jpn.*, **72**, 660-665 (1956).
- 777 Kawase, Y.: *Bull. Chem. Soc. Jpn.*, **31** (4) 390-393 (1958).
- 778 Kawase, Y.: *Bull. Chem. Soc. Jpn.*, **32** (1) 9-10 (1959).
- 779 Kawase, Y.: *Bull. Chem. Soc. Jpn.*, **32** (1) 11-12 (1959).
- 780 Kawase, Y.: *Bull. Chem. Soc. Jpn.*, **35** (4) 573-577 (1962).
- 781 Kenny, P. T. M.; Tamura, S. Y.; Fredenhagen, A.; Naya, Y.; Nakanishi, K.; Nishiyama, K.; Sugiura, M.; Kita, H. and Komura, H.: *Pestic. Sci.*, **27** (2) 117-131 (1989); *Chem. Abstr.*, **112**, 95155x (1990).
- 782 Kern, W. and Hummel, K.: *Eur. Polym. J.*, **30** (6) 731-734 (1994).
- 783 Khan, M. S. Y.; Drabu, S.; Chawla, G.; Agarwal, N.; Nasa, M. and Sharma, P.: *Indian J. Chem., Sect. B: Org. Chem. Incl. Med. Chem.*, **34B** (9) 839-840 (1995).
- 784 Khan, M. S. Y.; Venkatachalam, K.; Khan, M. H.; Javed, K. and Drabu, S.: *Indian J. Chem., Sect. B*: **29B** (11) 1067-1069 (1990).
- 785 Khanjin, N. A. and Menger, F. M.: *J. Org. Chem.*, **62** (25) 8923-8927 (1997).
- 786 Khilya, V. P.; Luk'yanchikov, M. S.; Kazarov, A. L. and Gorbunenko, N. V.: *Ukr. Khim. Zh.*, **50** (12) 1301-1306 (1984); *Chem. Abstr.*, **102**, 220613s (1985).
- 787 Khuhawar, M. Y.; Channar, A. H. and Shah, S. W.: *Eur. Polym. J.*, **34** (1) 133-135 (1998); *Chem. Abstr.*, **128**, 115319q (1998).
- 788 Khurana, S. K.; Krishnamoorthy, V.; Sanduja, S. K. and Parmar, V. S.: *Spectrochim. Acta, Part A*, **38A** (12) 1325-1328 (1982); *Chem. Abstr.*, **98**, 160113r (1983).
- 789 Kiang, A. K.; Sim, K. Y. and Goh, J.: *J. Chem. Soc.*, 6371-6374 (1965).
- 790 Kihara, M.; Ikeuchi, M. and Nagao, Y.: *Drug. Des. Discovery*, **12** (3) 259-271 (1995); *Chem. Abstr.*, **122**, 290146d (1995).
- 791 Kimura, Y. and Hoshi, M.: *J. Pharm. Soc. Jpn.*, **55**, 229-232 (1935).
- 792 Kimura, Y. and Hoshi, M.: *Proc. Imp. Acad. (Tokyo)*, **12** (9) 285-288 (1936); *Chem. Abstr.*, **31**, 1807<sup>6</sup> (1937).
- 793 Kimura, Y.: *J. Pharm. Soc. Jpn.*, **57**, 160-163 (1937).
- 794 Kimura, Y.: *J. Pharm. Soc. Jpn.*, **58**, 123-127 (1938).
- 795 Kimura, Y.: *J. Pharm. Soc. Jpn.*, **58**, 415-421 (1938).



- 796 Kindler, H. and Oelschlager, H.: *Chem. Ber.*, **87**, 194-202 (1954).  
797 Kindler, K. and Peschke, W.: *Archiv. Pharm. (Weinheim, Ger.)*, **269**, 581-606 (1931).  
798 Kindler, K.; Oelschlager, H. and Henrich, P.: *Arch. Pharm.*, **287**, 210-223 (1954).  
799 King, F. E. and Neill, K. G.: *J. Chem. Soc.*, 4752-4756 (1952).  
800 King, F. E.; King, T. J. and Stokes, P. J.: *J. Chem. Soc.*, 4587-4594 (1954).  
801 King, F. E.; King, T. J. and Stokes, P. J.: *J. Chem. Soc.*, 4594-4600 (1954).  
802 King, F. E.; King, T. J. and Warwick, A. J.: *J. Chem. Soc.*, 96-100 (1952).  
803 King, H. G. C.; White, T. and Hughes, R. B.: *J. Chem. Soc.*, 3234-3239 (1961).  
804 King, J. and Lord, G. H.: *Brit.* 1,204,121 (1970); *Chem. Abstr.*, **73**, 109683h (1970).  
805 King, J. and Lord, G. H.: *Brit.* 1,204,122 (1970); *Chem. Abstr.*, **73**, 109503z (1970).  
806 King, J. and Lord, G. H.: *U.S.* 3,720,690 (1973); *Chem. Abstr.*, **79**, 32066y (1973).  
807 King, L. C. and Ostrum, G. K.: *J. Org. Chem.*, **29**, 3459-3461 (1964).  
808 Kinoshita, K. and Murase, S.: *Yakugaku Zasshi*, **91** (10) 1105-1108 (1971); *Chem. Abstr.*, **76**, 11982s (1972).  
809 Kirk, T. K.; Harkin, J. M. and Cowling, E. B.: *Biochim. Biophys. Acta*, **165** (1) 145-163 (1968).  
810 Kirkiacharian, B.; Billet, D. and Mentzer, C.: *C. R. Acad. Sci.*, **257**, 2676-2678 (1963).  
811 Kitagawa, M.: *Jpn. Kokai Tokkyo Koho JP 63 83,089* [88 83,089] (1988); *Chem. Abstr.*, **109**, 128828n (1988).  
812 Kitagawa, M.; Mimura, T. and Tanaka, M.: *Chem. Pharm. Bull.*, **39** (12) 3382 (1991).  
813 Kitagawa, M.; Mimura, T. and Tanaka, M.: *Chem. Pharm. Bull.*, **39** (9) 2400-2407 (1991).  
814 Kitagawa, M.; Yamamoto, K.; Katakura, S.; Kanno, H.; Yamada, K.; Nagahara, T. and Tanaka, M.: *Chem. Pharm. Bull.*, **39** (10) 2681-2690 (1991).  
815 Kitazawa, M.; Okazaki, K.; Tamai, T.; Saito, M.; Tanaka, N.; Kobayashi, H.; Kikuchi, K. and Muranaka, H.: *PCT Int. Appl. WO 97 30,023* (1997); *Chem. Abstr.*, **127**, 205361f (1997).  
816 Kitazawa, M.; Okazaki, K.; Tamai, T.; Saito, M.; Tanaka, N.; Kobayashi, H.; Kikuchi, K. and Muranaka, H.: *PCT Int. Appl. WO 97 35,835* (1997); *Chem. Abstr.*, **127**, 262537s (1997).  
817 Klarmann, E.: *J. Am. Chem. Soc.*, **48**, 2358-2367 (1926).  
818 Klinger, K. H.: *Arzneim.-Forsch./Drug Res.*, **27** (1A) 4-14 (1977); *Chem. Abstr.*, **87**, 23212f (1977).  
819 Kloetzel, M. C.; Dayton, R. P. and Abadir, B. Y.: *J. Org. Chem.*, **20**, 38-49 (1955).  
820 Klutchko, S.; Cohen, M. P.; Shavel, J. R. and von Strandmann, M.: *J. Heterocycl. Chem.*, **11**, 183-188 (1974).  
821 Knoelker, H. J. and Bauermeister, M.: *Helv. Chim. Acta*, **76** (7) 2500-2514 (1993).  
822 Knoevenagel, E.: *Ber. Dtsch. Chem. Ges.*, **36**, 2136-2180 (1903).  
823 Kodama, H. and Yoshida, M.: *Jpn. Kokai Tokkyo Koho JP 08,182,499* [96,182,499] (1996); *Chem. Abstr.*, **125**, 219777s (1996).  
824 Kokila, M. K.; Nirmala, K. A.; Puttaraya and Shamala, N.: *Acta Crystallogr., Sect. C: Cryst. Struct. Commun.*, **C48** (6) 1133-1134 (1992).  
825 Kolycheva, M. T.; Yagupol'skii, Yu. L.; Zaitsev, L. M.; Gerus, I. I.; Kukhar, V. P. and Klebanov, B. M.: *Khim. Farm. Zh.*, **22** (2) 159-163 (1988); *Chem. Abstr.*, **109**, 213r (1988).  
826 Kometani, T.; Watt, D. S. and Ji, T.: *Tetrahedron Lett.*, **26** (17) 2043-2046 (1985).  
827 Kossmehl, G. and Froberg, H. C.: *Chem. Ber.*, **119** (1) 50-64 (1986).  
828 Kostanecki, S. and Tambor, J.: *Ber. Dtsch. Chem. Ges.*, **28**, 2302-2309 (1895).  
829 Kotake, M. and Fukui, K.: *J. Inst. Polytech. Osaka City Univ. [C]* **1** (1) 11-13 (1950); *Chem. Abstr.*, **45**, 4719e (1951).  
830 Kotali, A.: *Tetrahedron Lett.*, **35** (36) 6753-6754 (1994).  
831 Kotlyarevskii, I. L.; Shergina, S. I.; Sokolov, I. E. and Zanina, A. S.: *Izv. Akad. Nauk SSSR, Ser. Khim.*, (4) 828-833 (1971); *Chem. Abstr.*, **75**, 21086w (1971).  
832 Kotlyarevskii, I. L.; Zanina, A. S.; Gusenkova, N. M.; Sokola, I. K. and Cherepov, E. I.: *Vysokomol. Soedin, Ser. B* **9** (6) 468-470 (1967); *Chem. Abstr.*, **67**, 82510m (1967).  
833 Kouno, I.; Shigematsu, N.; Iwagami, M. and Kawano, N.: *Phytochemistry*, **24** (3) 620-621 (1985).  
834 Kovacs, O.: *Pharm. Zentralhalle Dtschl.*, **92** (6) 193-197 (1953).

- 835 Kowa, K. K.: JP 5,039,657 (1975).
- 836 Krannichfeldt, H.: Ber. Dtsch. Chem. Ges., **46**, 4016-4025 (1913).
- 837 Krause, J.; Stoeckli, M. and Schlunegger, V. P.: Rapid. Commun. Mass Spectrom., **10** (15) 1927-1933 (1996); Chem. Abstr., **126**, 168615y (1997).
- 838 Krause, M.; Rouleau, A.; Stark, H.; Garbarg, M.; Schwartz, J. C. and Schunack, W.: Pharmazie, **51** (10) 720-726 (1996).
- 839 Krishnamoorthy, V.; Seshadri, T. R. and Krishnaswamy, N. R.: Indian J. Chem., **10** (3) 258-259 (1972).
- 840 Krishnamurti, M. and Seshadri, T. R.: J. Sci. Ind. Res., **13B**, 474-475 (1954).
- 841 Krishnamurti, M. and Seshadri, T. R.: J. Sci. Ind. Res., **14B** (6) 258-260 (1955).
- 842 Krishnamurti, M. and Seshadri, T. R.: Proc. Indian Acad. Sci., **39A**, 144-152 (1954).
- 843 Krishnamurti, M. and Seshagiri, S. N.: Indian J. Chem., **15B** (3) 238-239 (1977).
- 844 Krishnamurty, H. G. and Prasad, J. S.: Tetrahedron Lett., **35**, 3071-3072 (1977).
- 845 Kruszewski, J.: Soc. Sci. Lodz., Acta Chim., **17**, 157-166 (1972); Chem. Abstr., **78**, 42647g (1973).
- 846 Kuhn, R. and Staab, H. A.: Chem. Ber., **87**, 266-272 (1954).
- 847 Kuhn, R.; Löw, I. and Trischmann, H.: Ber. Dtsch. Chem. Ges., **77B**, 202-210 (1944).
- 848 Kukla, A. S. and Seshadri, T. R.: Tetrahedron, **18**, 1443-1448 (1962).
- 849 Kulikova, A. E.; Viktorova, E. A.; Zotova, Z. A. and Shadskaya, L. P.: U.S.S.R. 411,101 (1974); Chem. Abstr., **81**, 121965z (1974).
- 850 Kulinskii, V. I.; Yashunskii, V. G.; Klimova, A. D. and Alpatova, T. V.: Radiats. Biol. Radioekol., **37** (6) 914-917 (1997); Chem. Abstr., **128**, 292223z (1998).
- 851 Kulkarni, S. U. and Thakar, K. A.: J. Indian Chem. Soc., **52** (9) 849-852 (1975).
- 852 Kulkarni, V. G.: J. Indian Chem. Soc., **40** (9) 808-810 (1963).
- 853 Kumar, A.; Rane, R. A.; Ravindran, V. K. and Dike, S. Y.: Synth. Commun., **27** (7) 1133-1141 (1997).
- 854 Kumar, Ashok; Rane, Ramakrishna Appaji and Ravindran, Vaikyaparambil Krishnan: Indian IN 171,707 (1992); Chem. Abstr., **122**, 265043k (1995).
- 855 Kumar, S.; Ram, L. and Ray, J. N.: J. Indian Chem. Soc., **23**, 365-370 (1946).
- 856 Kumari, D.; Chhabra, S. C. and Gupta, S. R.: Indian J. Chem., Sect. B **17B** (2) 168-169 (1979).
- 857 Kunckell, F. and Johannssen, F.: Ber. Dtsch. Chem. Ges., **31**, 169-172 (1898).
- 858 Kunckell, F.: Ber. Dtsch. Chem. Ges., **34**, 124-129 (1901).
- 859 Kunckell, F.: Ber. Dtsch. Pharm. Ges., **23**, 472-490 (1913).
- 860 Kupchan, S. M. and Bauerschmidt, E.: Phytochemistry, **10**, 664-666 (1971).
- 861 Kupchan, S. M.; Sigel, C. W.; Knox, J. R. and Udayamurthy, M. S.: J. Org. Chem., **34** (5) 1460-1463 (1969).
- 862 Kurokawa, M.; Yoshida, T.; Sato, H.; Matsuoka, N. and Satomura, K.: PCT Int. Appl. WO 98 09,956 (1998); Chem. Abstr., **128**, 230236x (1998).
- 863 Kuroono, M.; Baba, Y.; Iwata, N.; Oonishi, O.; Kakubuchi, M.; Isogawa, Y.; Mitani, T.; Ishiwatari, Y.; Oowaki, H. and Sawai, K.: Jpn. Kokai Tokkyo Koho JP 07 02,826 [95 02,826] (1995); Chem. Abstr., **122**, 290713m (1995).
- 864 Kurosawa, K. and Araki, F.: Bull. Chem. Soc. Jpn., **52** (2) 529-532 (1979).
- 865 Kvakovszky, G.; Vicari, R.; Fruchey, O. S.; Tafesh, A. M. and Hilton, C. B.: U.S. US 5,393,860 (1995); Chem. Abstr., **123**, 84259k (1995).
- 866 Kvakovszky, G.; Vicari, R.; Tafesh, A. M.; Juneau, K. N.; Fruchey, O. S.; McDonough, J. A. and Kuila, D.: U.S. US 5,459,266 (1995); Chem. Abstr., **124**, 147109e (1996).
- 867 Kyono, Y. and Tanaka, K.: Jpn. Kokai Tokkyo Koho JP 08,208,824 [96,208,824] (1996); Chem. Abstr., **125**, 248818m (1996).
- 868 La Forge, F. B.: J. Am. Chem. Soc., **55**, 3040-3048 (1933).
- 869 La Manna, A. and Campiglio, A.: Farmaco Ed. Sci., **14** (4) 317-322 (1959).
- 870 Labrie, F. and Merand, Y.: U.S. US 5,395,842 (1995); Chem. Abstr., **123**, 83209g (1995).
- 871 Labrie, F.; Merand, Y. and Gauthier, S.: PCT Int. Appl. WO 96 26,201 (1996); Chem. Abstr., **125**, 275650g (1996).
- 872 Lakshmi, C.; Raj, N. G.; Srinivasan, K. S. V. C. and Kumar, K. A.: J. Inst. Chem. (India), **60** (3) 114 (1988); Chem. abstr., **110**, 153838u (1989).

- 873 Lalitha, V. R. and Subba Rao, N. V.: *Proc. Indian Acad. Sci., Sect. A*: **77A** (4) 157-162 (1973).
- 874 Langenbeck, W. and Fischer, F.: *Pharmazie*, **5**, 56-57 (1950).
- 875 Langer, P. and Kohler, V.: *Chem. Commun. (Cambridge)* (17) 1653-1654 (2000).
- 876 Lanyi, G.; Kallay, T.; Ledniczky, L.; Arvai, L.; Imrei, L.; Somfai, E.; Montay, T.; Gepesz, R. and Denes Lustig, V.: *Can. Pat. Appl. CA* 2,056,979 (1991); *Chem. Abstr.*, **117**, 233596y (1992).
- 877 Lanyi, G.; Kallay, T.; Ledniczky, L.; Arvai, L.; Imrei, L.; Somfai, E.; Montay, T.; Gepesz, R. and Denes Lustig, V.: *PCT Int. Appl. WO* 91 16,293 (1991); *Chem. Abstr.*, **117**, 48102w (1992).
- 878 Laufer, S. A.; Augustin, J.; Dannhardt, G. and Kiefer, W.: *J. Med. Chem.*, **37** (12) 1894-1897 (1994).
- 879 Lazarevic, M.: *Glas. Hem. Tehnol. Makedonija*, **3** (1-4) 1-6 (1976); *Chem. Abstr.*, **90**, 22512d (1979).
- 880 Le Floch, Y. and Lefeuvre, M.: *Tetrahedron Lett.*, **27** (45) 5503-5504 (1986).
- 881 Le-Van-Thoi and Nguyen-Van-Hoang: *Ann. Fac. Sci., Univ. Saigon*, **1**, 19-30 (1963-1964); *Chem. Abstr.*, **65**, 3780<sup>b</sup> (1966).
- 882 Le-Van-Thoi and Nguyen-Van-Hoang: *Ann. Fac. Sci., Univ. Saigon*, 63-73 (1962); *Chem. Abstr.*, **62**, 2733a (1965).
- 883 Le-Van-Thoi and Nguyen-Van-Hoang: *Israel J. Chem.*, **1** (4) 418-427 (1963).
- 884 Le-Van-Thoi and Nguyen-Van-Hoang: *Vietnamica Chim. Acta*, 87-100 (1966); *Chem. Abstr.*, **71**, 124127g (1969).
- 885 Learmonth, D. A. and Alves, P. C.: *Synth. Commun.*, **32** (4) 641-649 (2002).
- 886 Learmonth, D. A. and Freitas, A. P.: *Bioconjugate Chem.*, **13** (5) 1112-1118 (2002).
- 887 Learmonth, D. A.; Vieira-Coelho, M. A.; Benes, J.; Alves, P. C.; Borges, N.; Freitas, A. P. and Soares-da-Silva, P.: *J. Med. Chem.*, **45** (3) 685-695 (2002).
- 888 Leclerc, G.; Bizet, J. C.; Bieth, N. and Schwartz, J.: *J. Med. Chem.*, **23** (7) 738-744 (1980).
- 889 Lednicer, D. and Grostic, M. F.: *J. Org. Chem.*, **32** (10) 3251-3253 (1967).
- 890 Lee, H. H. and Tan, C. H.: *J. Chem. Soc. C*, 1583-1585 (1967).
- 891 Lee, Ihn-Sook; Liu, Yin; Narazaki, M.; Hibi, M.; Kishimoto, T. and Taga, T.: *FEBS Lett.*, **401** (2,3) 133-137 (1997); *Chem. Abstr.*, **126**, 156260r (1997).
- 892 Lee, K.; Dudley, M. W.; Hess, K. M.; Lynn, D. G.; Joerger, R. D. and Binns, A. N.: *Proc. Natl. Acad. Sci. U.S.A.*, **89** (18) 8666-8670 (1992).
- 893 Lee, Kyunghye: *Bull. Korean Chem. Soc.*, **18** (1) 18-23 (1997).
- 894 Lee, Mi Kyeong; Yeo, Hosup; Kim, Jinwoong and Kim, Young Choong: *J. Pharm. Pharmacol.*, **52** (3) 341-345 (2000).
- 895 Lee, Mi Kyeong; Yeo, Hosup; Kim, Jinwoong; Markelonis, George J.; Oh, Tae H. and Kim, Young Choong: *J. Neurosci. Res.*, **59** (2) 259-264 (2000); *Chem. Abstr.*, **132**, 231848t (2000).
- 896 Lee, T. T.; Starratt, A. N. and Jevnikar, J. J.: *Phytochemistry*, **21** (3) 517-523 (1982).
- 897 Legerlotz, H.: *CH* 171,977 (1930).
- 898 Legerlotz, H.: *Chem. Zentralbl.*, **I**, 586 (1930).
- 899 Legerlotz, H.: *Chem. Zentralbl.*, **I**, 1, 1048 (1929).
- 900 Legerlotz, H.: *DE* 518,636 (1927).
- 901 Legerlotz, H.: *DE* 520,079 (1926).
- 902 Leon, A.; Robertson, A.; Robinson, R. and Seshadri, T. R.: *J. Chem. Soc.*, 2672-2701 (1931).
- 903 Lesieur, D.; Fourmaintraux, E.; Depreux, P.; Delagrangé, P.; Renard, P. and Guardiola-Lemaitre, B.: *Eur. Pat. Appl. EP* 721,947 (1996); *Chem. Abstr.*, **125**, 167778w (1996).
- 904 Lespagnol, A.; Mercier, F.; Bertrand, J. and Mercier, J.: *Ann. Pharm. Fr.*, **8** (4) 241-261 (1950).
- 905 Lespagnol, C.; Lesieur, D. and Bonte, J. P.: *Ger. Offen.* 2,429,561 (1975); *Chem. Abstr.*, **82**, 139692p (1975).
- 906 Letsinger, R. L. and Collat, R.: *J. Am. Chem. Soc.*, **74**, 621-623 (1952).
- 907 Levai, A. and Sebok, P.: *Synth. Commun.*, **22** (12) 1735-1750 (1992).
- 908 Levin, N.: *PhD. Thesis, University of Maryland, USA* (1942).
- 909 Levy, L. F. and Robinson, R.: *J. Chem. Soc.*, 2715-2722 (1931).

- 910 Lewis, G.P.: *Br. J. Pharmacol. Chemother.*, **9**, 488-493 (1954).
- 911 Li, Guoqing and Bittman, R.: *Tetrahedron Lett.*, **41** (35) 6737-6741 (2000).
- 912 Li, Hong-Yu; Nehira, T.; Hagiwara, M. and Harada, N.: *J. Org. Chem.*, **62** (21) 7222-7227 (1997).
- 913 Libermann, D. and Moyeux, M.: *Bull. Soc. Chim. Fr.*, 50-54 (1952).
- 914 Libermann, D. and Moyeux, M.: *Bull. Soc. Chim. Fr.*, 166-171 (1956).
- 915 Libermann, D.: *Fr.* 1,179,924 (1959); *Chem. Abstr.*, **55**, 19870c (1961).
- 916 Liebman, A. A. and Liu, Yu-Ying: *U.S.* 4,107,182 (1978); *Chem. Abstr.*, **90**, 72165p (1979).
- 917 Lietti, A. and Bonati, A.: *Ger. Offen.* 2,740,346 (1978); *Chem. Abstr.*, **88**, 177226w (1978).
- 918 Lietti, A. and Bonati, A.: *Ger. Offen.* 2,808,823 (1979); *Chem. Abstr.*, **92**, 11231b (1980).
- 919 Ligon, J. M.; Hill, D. S.; Hammer, P. E.; Torkewitz, N. R.; Hofmann, D.; Kempf, H.-J. and Van Pee, K.-H.: *Pest. Manage Sci.*, **56** (8) 688-695 (2000); *Chem. Abstr.*, **133**, 204096k (2000).
- 920 Limaye, D. B. and Nagarkar, V. V.: *Rasayanam*, **1**, 255-257 (1943); *Chem. Abstr.*, **38**, 4264<sup>4</sup> (1944).
- 921 Limaye, D. B.: *Rasayanam*, **1**, 246-250 (1943); *Chem. Abstr.*, **38**, 4258<sup>4</sup> (1944).
- 922 Limaye, P. A.: *Biovigyanam*, **2** (2) 183-185 (1976); *Chem. Abstr.*, **92**, 22344s (1980).
- 923 Limaye, S. D. and Limaye, D. B.: *Rasayanam*, **1**, 109-112 (1937); *Chem. Abstr.*, **32**, 2095<sup>s</sup> (1938).
- 924 Lin, Chun-Nan; Huang, Pao-Lin; Lu, Chai-Ming; Yen, Ming-Hong and Wu, Ru-Rong: *Phytochemistry*, **44** (7) 1359-1363 (1997).
- 925 Lin, Chun-Nan; Huang, Pao-Lin; Wang, Jeh-Jeng; Day, Shiow-Hwa; Lin, Hsien-Cheng; Wang, Jih-Pyang; Ko, Ya-Ling and Teng, Che-Ming: *Biochim. Biophys. Acta*, **1380** (1) 115-122 (1998).
- 926 Lin, L. C.; Chou, C. J.; Chen, K. T. and Chen, C. F.: *J. Nat. Prod.*, **56** (6) 926-928 (1993).
- 927 Lin, Shin An and Ho, Chi Man: *Hua Hsueh*, **41** (3) 107-111 (1983); *Chem. Abstr.*, **101**, 170837z (1984).
- 928 Lin, Yun-Lian; Lin, Tung-Chieh and Kuo, Yueh-Hsiung: *J. Nat. Prod.*, **60** (4) 368-370 (1997).
- 929 Lindstad, R. I.; Koll, P. and McKinley-McKee, J. S.: *Biochem. J.*, **330** (1) 479-487 (1998).
- 930 Lindstedt, G. and Misiorny, A.: *Acta Chem. Scand.*, **5**, 1212-1216 (1951).
- 931 Linnell, W. H. and Roushdi, I. M.: *Quart. J. Pharm. Pharmacol.*, **14**, 270-280 (1941).
- 932 Liu, Gengtao; Huang, Liang and Rao, Erchang: *Faming Zhuanli Shenqing Gongkai Shuomingshu* CN 1,052,855 (1991); *Chem. Abstr.*, **116**, 128905e (1992).
- 933 Looker, J. H.; McMechan, J. H. and Mader, J. W.: *J. Org. Chem.*, **43** (12) 2344-2347 (1978).
- 934 Lu, Yixian; Hu, Dun and Cai, Mengshen: *Beijing Yike Daxue Xuebao*, **22** (4) 287-288 (1990).
- 935 Luis, J. G. and Andres, L. S.: *J. Chem. Res., Synop.*, (3) 220-221 (1999).
- 936 Luk'yanchikov, M. S.; Khilya, V. P. and Kazakov, A. A.: *Khim. Pri. Soedin.*, (6) 781-784 (1985); *Chem. Abstr.*, **106**, 66952a (1987).
- 937 Luk, Kin Chun; Stern, Lorraine; Weigele, M.; O'Brien, R. A. and Spirt, N.: *J. Nat. Prod.*, **46** (6) 852-861 (1983); *Chem. Abstr.*, **100**, 96557u (1984).
- 938 Lundquist, K.; Josefsson, B. and Nyquist, G.: *Holzforschung*, **32** (1) 27-32 (1978); *Chem. Abstr.*, **88**, 154594a (1978).
- 939 Lunts, L. H. C. and Judkins, B. D.: *Brit. UK Pat. Appl. GB 2,230,775* (1990); *Chem. Abstr.*, **114**, 185280e (1991).
- 940 Lynch, H. M.; O'Toole, T. M. and Wheeler, T. S.: *J. Chem. Soc.*, 2063-2067 (1952).
- 941 Machida, S.; Kawamonzon, Y. and Oba, M.: *Jpn. Kokai Tokkyo Koho JP 09,297,400* [97,297,400] (1997); *Chem. Abstr.*, **128**, 68498k (1998).
- 942 MacMillan, J.; Mulholland, T. P. C.; Dawkins, A. W. and Ward, G.: *J. Chem. Soc.*, 429-435 (1954).
- 943 Mahal, H. S. and Venkataraman, K.: *J. Chem. Soc.*, 616-617 (1933).
- 944 Mahal, H. S.; Rai, H. S. and Venkataraman, K.: *J. Chem. Soc.*, 1769-1771 (1934).

- 945 Mahato, S. B.; Mandal, N. B.; Pal, A. K. and Maitra, S. K.: *Tetrahedron*, **43** (19) 4439-4445 (1987).
- 946 Maillard, J.; Langlois, M.; Delaunay, P.; VO Van Tri; Garcia, G.; Lannoy, J.; Roussillon, J. L.; Morin, R.; Eskenazi, P.; Benharkate, M.; Manuel, C. and Motosso, F.: *Chim. Ther.*, **7** (6) 458-466 (1972).
- 947 Maki, T.; Araki, Y. and Moryasu, M.: *Jpn. Kokai Tokkyo Koho JP 05,178,783* [93,178,783] (1993); *Chem. Abstr.*, **119**, 270803a (1993).
- 948 Maki, T.; Araki, Y.; Moryasu, M. and Yamagata, N.: *Jpn. Kokai Tokkyo Koho JP 05,178,784* [93,178,784] (1993); *Chem. Abstr.*, **119**, 249689h (1993).
- 949 Makrandi, J. K. and Grover, S. K.: *Indian J. Chem., Sect. B*, **16B** (11) 1118-1119 (1978).
- 950 Malan, E. and Naidoo, S.: *Phytochemistry*, **19** (12) 2731-2733 (1980).
- 951 Malan, E. and Roux, D. G.: *J. Chem. Soc., Perkin Trans. 1*, (11), 2696-2703 (1979).
- 952 Malik, M. L. and Grover, S. K.: *Indian J. Chem., Sect. B*, **14B** (7) 513-515 (1976).
- 953 Malik, M. L. and Grover, S. K.: *J. Indian Chem. Soc.*, **57** (2) 208-211 (1980).
- 954 Malik, M. L.: Ph. D., Delhi University, Delhi, India (1977).
- 955 Mallion, Keith Blakeney; Brown, George Robert and Whittamore, Paul Robert Owen: *PCT Int. Appl. WO 94 03,451* (1994); *Chem. Abstr.*, **122**, 213933f (1995).
- 956 Marnett, L. J.: *Gazz. Chim. Ital.*, **56**, 759-772 (1926).
- 957 Mandal, A.; Guha, D.; Das, R.; Mitra, S. and Mukherjee, S.: *J. Chem. Phys.*, **114** (3) 1336-1343 (2001); *Chem. Abstr.*, **134**, 193105c (2001).
- 958 Mandal, S. K. and Nag, K.: *J. Chem. Soc., Dalton Trans.*, (10) 2141-2149 (1984).
- 959 Mandal, S. K. and Nag, K.: *J. Chem. Soc., Dalton Trans.*, (11) 2429-2434 (1983).
- 960 Mani, N. V. and Sethna, S.: *J. Inst. Chem., Calcutta*, **46** (3) 61-65 (1974); *Chem. Abstr.*, **82**, 97918j (1975).
- 961 Mani, R. I.; Powers, P. F. and Drummond, L.: *J. Tenn. Acad. Sci.*, **68** (3) 83-86 (1993); *Chem. Abstr.*, **120**, 322985d (1994).
- 962 Mani, R.; Herbert, L. and Manise, D.: *J. Tenn. Acad. Sci.*, **66** (1) 1-8 (1991); *Chem. Abstr.*, **114**, 163805c (1991).
- 963 Mannich, C. and Hahn, F. L.: *Ber. Dtsch. Chem. Ges.*, **44**, 1542-1552 (1911).
- 964 Markham, K. R.; Rahman, W.; Jehan, S. and Mabry, T. J.: *J. Heterocycl. Chem.*, **4** (1) 61-65 (1967).
- 965 Martin, R. and Coton, G.: *Bull. Soc. Chim. Fr.*, **4**, 1438-1442 (1973).
- 966 Martin, R.: *Bull. Soc. Chim. Fr.*, **9-10**, 901-905 (1977).
- 967 Martin, R.: *Handbook of Hydroxyacetophenones*, editor Kluwer Academic Publishers, Dordrecht, the Netherlands (1997).
- 968 Martin, R.: *Handbook of Hydroxybenzophenones*, editor Kluwer Academic Publishers, Dordrecht, the Netherlands (2000).
- 969 Martin, R.: *Monatsh Chem.*, **112**, 1155-1163 (1981).
- 970 Martin, R.: *Thèse Ingénieur CNAM*, Paris (1961).
- 971 Martin, R.; Gros, N.; Böhrer, V. and Kämmerer, H.: *Monatsh Chem.*, **111** (1) 81-92 (1980).
- 972 Martin, R.; Lafrance, J. R. and Demerseman, P.: *Bull. Soc. Chim. Belg.*, **100** (7) 539-548 (1991).
- 973 Maruyama, K. and Narita, N.: *J. Org. Chem.*, **45** (8) 1421-1424 (1980).
- 974 Marvell, E. N.; Reed, J. K.; Gänzler, W. and Tong, H.: *J. Org. Chem.*, **42** (23) 3783-3784 (1977).
- 975 Mase, T.; Arima, H.; Tomioka, K.; Yamada, T. and Murase, K.: *J. Med. Chem.*, **29** (3) 386-394 (1986).
- 976 Matsumoto, Seiichiro; Kobayashi, Hiroshi and Ueno, Keihei: *Bull. Chem. Soc. Jpn.*, **42** (4) 960-968 (1969).
- 977 Matsunaga, Y. and Imafuku, K.: *Bull. Chem. Soc. Jpn.*, **65**, 295-297 (1992).
- 978 Matthews, R. S.: *PCT Int. Appl. WO 97 18,191* (1997); *Chem. Abstr.*, **127**, 50397w (1997).
- 979 Mauri, L. and Nardi, D.: *Farmaco, Ed. Prat.*, **18** (12) 651-656 (1963).
- 980 Mauthner, F.: *J. Prakt. Chem.*, **118**, 314-320 (1928).
- 981 Mauthner, F.: *J. Prakt. Chem.*, **119**, 311-314 (1928).

- 982 Mbwapbo, Z. H.; Lee, S. K.; Mshiu, E. N.; Pezzuto, J. M. and Kinghorn, A. D.: *J. Nat. Prod.*, **59** (11) 1051-1055 (1996).
- 983 McDonough, J. A.; Tafesh, A. M. and Fruchey, O. S.: U.S. US 5,319,142 (1994); *Chem. Abstr.*, **121**, 82699p (1994).
- 984 McGarry, E. J. and Forsyth, B. A.: *Pat. Specif. (Aust.)* AU 523,158 (1982); *Chem. Abstr.*, **99**, 5341r (1983).
- 985 McGookin, A.; Robertson, A. and Simpson, T. H.: *J. Chem. Soc.*, 2021-2029 (1951).
- 986 McMurry, T. B. H. and Theng, C. Y.: *J. Chem. Soc.*, 1491-1498 (1960).
- 987 McPhee, W. D. and Erickson, E. S., Jr.: *J. Am. Chem. Soc.*, **68**, 624-627 (1946).
- 988 Mehta, A. C. and Seshadri, T. R.: *J. Chem. Soc.*, 3823-3825 (1954).
- 989 Mehta, A. C.; Seshadri, T. R. and Varadarajan, S.: *Proc. Indian Acad. Sci., Sect. A*, **38A** (5) 381-386 (1953).
- 990 Meier, W. and Fürst, A.: *Helv. Chim. Acta*, **45**, 232-239 (1962).
- 991 Meikle, T. and Stevens, R.: *J. Chem. Soc., Perkin Trans. 1*, (11) 1303-1312 (1978).
- 992 Mejias, L.; Reihmann, M. H.; Sepulveda-Boza, S. and Ritter, H.: *Macromol. Biosci.*, **2** (1) 24-32 (2002).
- 993 Mendel, A.: *J. Chem. Eng. Data*, **11** (4) 585-586 (1966).
- 994 Mentzer, C. and Meunier, P.: *Bull. Soc. Chim. Biol.*, **29**, 977-981 (1947).
- 995 Mentzer, C. and Meunier, P.: *C. R. Acad. Sci.*, **225**, 1329-1331 (1947).
- 996 Mentzer, C.; Chopin, J. and Mercier, M.: *C. R. Acad. Sci.*, **242**, 1034-1036 (1956).
- 997 Mercer, J. R.; Wiebe, L. I. and Chapman, J. D.: *NucCompact*, **22** (2) 40-46 (1991); *Chem. Abstr.*, **116**, 190279g (1992).
- 998 Merchant, J. R. and Dike, S. Y.: *Indian J. Chem.*, **13** (8) 861-862 (1975).
- 999 Merck, E.; A.-G.: *Fr. M* 3687 (1965); *Chem. Abstr.*, **68**, 12685u (1968).
- 1000 Merrill, E. J. and Lewis, A. D.: *J. Labelled Compd. Radiopharm.*, **13** (3) 385-391 (1977); *Chem. Abstr.*, **88**, 22536y (1978).
- 1001 Mertens, J. J. R.: *PCT Int. Appl. WO 94* 14,477 (1994); *Chem. Abstr.*, **121**, 157298t (1994).
- 1002 Meussdoerffer, J. N. and Niederpruem, H.: *Ger. Offen.* 2,653,601 (1978); *Chem. Abstr.*, **89**, 129265g (1978).
- 1003 Mezheritskii, V. V. and Dorofeenko, G. N.: *Zh. Org. Khim.*, **5** (3) 515-517 (1969).
- 1004 Miguel, M. G. and Barroso, J. G.: *Phytochemistry*, **35** (2) 371-375 (1994).
- 1005 Miksche, G. E.: *Acta Chem. Scand.*, **27** (4) 1355-1368 (1973).
- 1006 Minatoya, H.; Tullar, B. F. and Conway, W. D.: *Fr. Demande* 2,042,295 (1971); *Chem. Abstr.*, **76**, 14129e (1972).
- 1007 Minatoya, H.; Tullar, B. F. and Conway, W. D.: *Ger. Offen.* 2,015,573 (1970); *Chem. Abstr.*, **74**, 53268c (1971).
- 1008 Minatoya, H.; Tullar, B. F. and Conway, W. D.: U.S. 3,904,671 (1975); *Chem. Abstr.*, **84**, 16943e (1976).
- 1009 Minatoya, H.; Tullar, B. F. and Conway, W. D.: U.S. 4,138,581 (1979); *Chem. Abstr.*, **91**, 91338j (1979).
- 1010 Miquel, J. F.; Muller, P. and Buu-Hoi, N. P.: *Bull. Soc. Chim. Fr.*, 633-636 (1956).
- 1011 Misra, G. C.; Pande, L. M.; Joshi, G. C. and Misra, A. K.: *Aust. J. Chem.*, **25**, 1579-1581 (1972).
- 1012 Mitra, S. S. and Sreekumar, K.: *J. Polym. Sci., Part A: Polym. Chem.*, **35** (8) 1413-1421 (1997); *Chem. Abstr.*, **127**, 17225r (1997).
- 1013 Mitra, S. S. and Sreekumar, K.: *Polymer*, **38** (6) 1363-1366 (1997); *Chem. Abstr.*, **126**, 277046j (1997).
- 1014 Mitra, S.; Das, R. and Mukherjee, S.: *Chem. Phys. Lett.*, **228** (4-5) 393-397 (1994).
- 1015 Mittal, O. P. and Seshadri, T. R.: *J. Chem. Soc.*, 2176-2178 (1956).
- 1016 Mitter, P. C. and Maitra, S. S.: *J. Indian Chem. Soc.*, **13**, 236-239 (1936).
- 1017 Moed, H. D.; Asscher, M.; Van Draanen, P. J. A. and Niewind, H.: *Recl. Trav. Chim. Pays-Bas*, **71**, 933-944 (1952).
- 1018 Moed, H. D.; van Dijk, J. and Niewind, H.: *Recl. Trav. Chim. Pays-Bas*, **74**, 919-936 (1955).
- 1019 Moersch, G. W.; Morrow, D. F. and Neuklis, W. A.: *J. Med. Chem.*, **10** (2) 154-158 (1967).

- 1020 Moffett, R. B.: *J. Chem. Eng. Data*, **25** (2) 176-183 (1980).
- 1021 Mohakhud, P. K.; Goyal, S.; Grover, N.; Saradhi, K. P. and Parthasarathy, M. R.: *Indian J. Chem., Sect. B: Org. Chem. Incl. Med. Chem.*, **35B** (9) 904-910 (1996).
- 1022 Mohan, S. B.; Jhingan, A. K.; Vij, R. K.; Parthasarathi, J. and Murti, V. V. S.: *Curr. Sci.*, **48** (9) 393-394 (1979); *Chem. Abstr.*, **91**, 107760d (1979).
- 1023 Mohan, S. B.; Pal, K. and Murti, V. V. S.: *Indian J. Chem., Sect. B*: **21B** (8) 714-717 (1982).
- 1024 Mohanty, S. and Grover, S. K.: *Curr. Sci.*, **57** (10) 537-538 (1988); *Chem. Abstr.*, **109**, 169971x (1988).
- 1025 Moinet, G.; Imbert, I.; Marais, D.; Vidaluc, J. L. and Mesangeau, D.: *Can. Pat. Appl. CA* 2,028,031 (1992); *Chem. Abstr.*, **119**, 116970w (1993).
- 1026 Moinet, G.; Imbert, T.; Marais, D. and Vidaluc, J. L.: *Fr. Demande FR* 2,653,119 (1991); *Chem. Abstr.*, **115**, 279586g (1991).
- 1027 Molteni, L.; Trebbi, A.; Vercesi, G. and Signorini, M.: *Fr. Demande* 2,215,954 (1974); *Chem. Abstr.*, **82**, 139626v (1975).
- 1028 Monties, B.; Marine-Font, A. and Douillard, R. *Ann. Physiol. Veg.*, **11** (4) 313-339 (1969); *Chem. Abstr.*, **77**, 31099h (1972).
- 1029 Moore, G. G. I.; Harrington, J. K. and Swingle, K. F.: *J. Med. Chem.*, **18** (4) 386-391 (1975).
- 1030 Moore, M. L. and Corrigan J. R. (to Sterling Drug Inc.): *U.S.* 2,460,143 (1949); *Chem. Abstr.*, **43**, 3460e (1949).
- 1031 Morgan, T. D.; Hopkins, T. L.; Kramer, K. J.; Roseland, C. R.; Czapl, T. H.; Tomer, K. B. and Crow, F. W.: *Insect Biochem.*, **17** (2) 255-263 (1987); *Chem. Abstr.*, **106**, 173249y (1987).
- 1032 Mori, K.; Audran, G. and Monti, H.: *Synlett*, (3), 259-260 (1998).
- 1033 Moriarty, R. M.; Prakash, O. and Duncan, M. P.: *Synth. Commun.*, **16** (10) 1239-1245 (1986).
- 1034 Moriarty, R. M.; Prakash, O.; Ducan, M. P.; Vaid, R. V. and Musallam, H. A.: *J. Org. Chem.*, **52**, 150-153 (1987).
- 1035 Morisawa, Y.; Kataoka, M.; Nagahari, H.; Shimoji, Y.; Saito, F.; Sugiyama, M.; Koike, H. and Oshima, T.: *Eur. Pat. Appl. EP* 238,357 (1987); *Chem. Abstr.*, **108**, 56125k (1988).
- 1036 Moriyama, S.; Okigawa, M. and Kawano, N.: *Tetrahedron Lett.*, (21) 2105-2108 (1972).
- 1037 Morton, R. A. and Stubbs, A. L.: *J. Chem. Soc.*, 1347-1359 (1940).
- 1038 Moryasu, M. and Maki, T.: *Jpn. Kokai Tokkyo Koho JP* 05,194,308 [93,194,308] (1993); *Chem. Abstr.*, **120**, 54325z (1994).
- 1039 Moryasu, M.; Maki, T. and Araki, Y.: *Jpn. Kokai Tokkyo Koho JP* 05,194,309 [93,194,309] (1993); *Chem. Abstr.*, **120**, 54326a (1994).
- 1040 Moshfegh, A. A.; Badri, R.; Hojjatie, M.; Kaviani, M.; Naderi, B.; Nazmi, A. H.; Ramezani, M.; Roozpeikar, A. H. and Hakimelahi, G. H.: *Helv. Chim. Acta*, **65** (4) 1221-1228 (1982).
- 1041 Moshfegh, A.; Fallab, S. and Erlenmeyer, H.: *Helv. Chim. Acta*, **40**, 1157-1166 (1957).
- 1042 Mott, G. N.; Durrwachter, J. R.; and Tafesh, A.: *PCT Int. Appl. WO* 93 17,989 (1993); *Chem. Abstr.*, **120**, 30556z (1994).
- 1043 Mühlenbeck, U. and Barz, W.: *Phytochemistry*, **44** (5) 865-867 (1997).
- 1044 Mühlenbeck, U.; Kortenbusch, A. and Barz, W.: *Phytochemistry*, **42** (6) 1573-1579 (1996).
- 1045 Mujeeb-ur-Rahman; Siddiqi, Zeba S. and Zaman, Asif: *J. Chem. Res., Synop.*, (9) 256-257 (1991).
- 1046 Mukerji, D.: *Justus Liebigs Ann. Chem.*, **619**, 189-191 (1958).
- 1047 Muller, G.; Amiard, G. and Mathieu, J.: *Bull. Soc. Chim. Fr.*, 533-535 (1949).
- 1048 Munns, R. K.; Roybal, J. E.; Shimoda, W. and Hurlbut, J. A.: *J. Chromatogr.*, **442**, 209-218 (1988).
- 1049 Muntwyler, R. and Menasse, R.: *Eur. Pat. Appl.* 31,795 (1981); *Chem. Abstr.*, **95**, 150463d (1981).
- 1050 Muradian, J. and Ferreira, P. C.: *An. Farm. Quim. Sao Paulo*, **18** (1) 125-130 (1978); *Chem. Abstr.*, **91**, 20256v (1979).
- 1051 Murai, J.: *Science Repts. Saitama Univ.*, **1**, 23-26 (1952); *Chem. Abstr.*, **49**, 3889a (1955).

- 1052 Murai, J.: Science Repts. Saitama Univ., **1A**, 139-146 (1954); Chem. Abstr., **50**, 981f (1956).
- 1053 Murai, J.: Science Repts. Saitama Univ., **1A**, 147-151 (1954); Chem. Abstr., **50**, 981g (1956).
- 1054 Murase, K.; Mase, T.; Ida, H.; Takahashi, K. and Murakami, M.: Chem. Pharm. Bull., **25**, 1368-1377 (1977).
- 1055 Murphy, M. A.; Kvakovszky, G. and Fritch, J. R.: PCT Int. WO 93 15,063 (1993); Chem. Abstr., **121**, 84281v (1994).
- 1056 Murphy, S. T.; Ritchie, E. and Taylor, W. C.: Aust. J. Chem., **27** (1) 187-194 (1974).
- 1057 Murthy, Y. L. N. and Srinivas, A. S. S. V.: Indian J. Heterocycl. Chem., **1** (2) 91-94 (1991); Chem. Abstr., **116**, 214191a (1992).
- 1058 Murti, V. V. S.; Row, L. R. and Seshadri, T. R.: Proc. Indian Acad. Sci., Sect. A, **24A**, 233-237 (1946).
- 1059 Nadkarni, D. R. and Wheller, T. S.: J. Chem. Soc., 589-591 (1936).
- 1060 Nagashima, A. and Uenishi, K.: Jpn. Kokai Tokkyo Koho JP 03,239,261 [91,239,261] (1991); Chem. Abstr., **118**, 136265c (1993).
- 1061 Naik Satam, P. G. and Bringi, N. V.: Indian J. Chem., **11** (3) 209-210 (1973).
- 1062 Naik, G. N. and Crawford, T. H.: Indian J. Chem., **4**, 273-274 (1966).
- 1063 Naik, R. M.: Ph. D. Thesis, Bombay University (1955).
- 1064 Naka, T. and Hisano, M.: Jpn. Kokai Tokkyo Koho JP 02,275,869 [90,275,869] (1990); Chem. Abstr., **114**, 185525p (1991).
- 1065 Nakamura, N. and Oki, M.: Bull. Chem. Soc. Jpn., **45** (8) 2565-2570 (1972).
- 1066 Nakane, H.; Arisawa, M.; Fujita, A.; Koshimura, S. and Ono, K.: FEBS Lett., **286** (1-2) 83-85 (1991); Chem. Abstr., **115**, 126482v (1991).
- 1067 Nakata, K.; Harada, N.; Sumitomo, K. and Yoneda, K.: Biosci., Biotechnol., Biochem., **64** (3) 459-465 (2000).
- 1068 Nakazawa, K. and Kusuda, K.: J. Pharm. Soc. Jpn., **75**, 257-260 (1955).
- 1069 Nakazawa, K. and Matsuura, S.: J. Pharm. Soc. Jpn., **74**, 69-72 (1954).
- 1070 Nakazawa, K.: J. Pharm. Soc. Jpn., **74**, 836-839 (1954).
- 1071 Nakazawa, K.; Matsuura, S. and Kusuda, K.: J. Pharm. Soc. Jpn., **74**, 495-497 (1954).
- 1072 Nanda, K. K.; Addison, A. W.; Paterson, N.; Sinn, E.; Thompson, L. K. and Sakaguchi, U.: Inorg. Chem., **37** (5) 1028-1035 (1998); Chem. Abstr., **128**, 187813u (1998).
- 1073 Narasimhachari, N. and Seshadri, T. R.: Proc. Indian Acad. Sci., **32A**, 342-347 (1950).
- 1074 Narasimhachari, N. and Seshadri, T. R.: Proc. Indian Acad. Sci., Sect. A, **32A** (4) 256-263 (1950).
- 1075 Narasimhachari, N.; Rajagopalan, D. and Seshadri, T. R.: J. Sci. Ind. Res., **11B** (8) 347-348 (1952).
- 1076 Narasimhachari, N.; Rajagopalan, D. and Seshadri, T. R.: J. Sci. Ind. Res., **12B** (7) 287-293 (1953).
- 1077 Nasa, M.: M. Pharm. Thesis, Hamdard University, New Delhi, India (1994).
- 1078 Nath, S.: PhD Thesis, University of Kalyani, India (1983).
- 1079 Neamati, N.; Mazumder, A.; Zhao, H.; Sunder, S.; Burke, T. R., Jr.; Schultz, R. J. and Pommier, Y.: Antimicrob. Agents Chemother., **41** (2) 385-393 (1997); Chem. Abstr., **126**, 220325v (1997).
- 1080 Neill, K. G.: J. Chem. Soc., 3454-3455 (1953).
- 1081 Nencki, M.: Ber. Dtsch. Chem. Ges., **30**, 1766-1768 (1897).
- 1082 Nencki, M.: Ber. Dtsch. Chem. Ges., **32**, 2414-2419 (1899).
- 1083 Nencki, M.: Zh. Russ. Fiz. Khim. O-va, **1**, 110-125 (1893).
- 1084 Ney, E.: Ber. Dtsch. Chem. Ges., **21**, 2445-2452 (1888).
- 1085 Ng, S. C.; Sim, K. Y. and Loh, S. E.: Bull. Singapore Natl. Inst. Chem., **20**, 193-197 (1992); Chem. Abstr., **118**, 254651y (1993).
- 1086 Nicolaidis, D. N.; Fylaktakidou, K. C.; Bezergiannidou-Balouktsi, C. and Litinas, K. E.: J. Heterocycl. Chem., **31** (1) 173-176 (1994).
- 1087 Nielsen, J. G.; Norgaard, P. and Hjeds, H.: Acta Chim. Scand., **24** (2) 724-726 (1970).
- 1088 Nielsen, M. N.; Sørensen, J.; Fels, J. and Pedersen, H. C.: Appl. Environ. Microbiol., **64** (10) 3563-3569 (1998).



- 1089 Niemann, W.; Böhmer, V.; Evers, H. and Kämmerer, H.: *Makromol. Chem.*, **158**, 123-134 (1972).
- 1090 Nierenstein, M.; Wang, D. G. and Warr, J. C.: *J. Am. Chem. Soc.*, **46**, 2551-2555 (1924).
- 1091 Niklas, K. J. and Giannasi, D. E.: *Science*, **197** (4305) 767-769 (1977).
- 1092 Nishina, A.; Kajishima, F.; Matsunaga, M.; Tezuka, H.; Inatomi, H. and Osawa, T.: *Biosci., Biotechnol., Biochem.*, **58** (2) 293-296 (1994); *Chem. Abstr.*, **120**, 215727z (1994).
- 1093 Niyazov, A. N.; Namotov, B. and Atlyev, Kh.: *Izv. Akad. Nauk Turkm. SSR Ser. Fiz.-Tekh., Khim. Geol. Nauk*, (6) 65-68 (1974); *Chem. Abstr.*, **83**, 58366d (1975).
- 1094 Nodiff, E. A.; Hulsizer, J. M. and Tanabe, K.: *Chem. Ind. (London)*, 962-963 (1974).
- 1095 Noelting, E. and Kadiera, V.: *Ber. Dtsch. Chem. Ges.*, **39**, 2056-2061 (1906).
- 1096 Nohara, A.; Ukawa, K. and Sanno, Y.: *Tetrahedron Lett.*, (22) 1999-2002 (1973).
- 1097 Nohara, A.; Ukawa, K. and Sanno, Y.: *Tetrahedron*, **30** (19) 3563-3568 (1974).
- 1098 Nohara, A.; Umetani, T. and Sanno, Y.: *Tetrahedron*, **30** (19) 3553-3561 (1974).
- 1099 Nolan, T. J.; Pratt, D. D. and Robinson, R.: *J. Chem. Soc.*, 1968-1971 (1926).
- 1100 Nomura, Y.; Yamakawa, T.; Nishioka, K.; Omura, T.; Miyake, N.; Masaki, M. and Nohira, H.: *Chem. Pharm. Bull.*, **43** (2) 241-246 (1995).
- 1101 Nonni, A. J. and Dence, C. W.: *Holzforschung*, **42** (1) 37-46 (1988); *Chem. Abstr.*, **108**, 188675z (1988).
- 1102 Nore, P. and Honkanen, E.: *J. Heterocycl. Chem.*, **17** (5) 985-987 (1980).
- 1103 Norton, P. P.; George, A. D.; Abdulminium, H.; Abdallah, J. W. and Daly, D. U.: *J. Med. Chem.*, **31**, 2034-2039 (1988).
- 1104 Notz, R.; Maurhofer, M.; Dubach, H.; Haas, D. and Défago, G.: *Appl. Environ. Microbiol.*, **68** (5) 2229-2235 (2002).
- 1105 Nowakowska, E.; Daszkiewicz, Z. and Kyziol, J. B.: *Pol. J. Chem.*, **72**, 1191-1197 (1998).
- 1106 Nowshad, F. and Ul-Haque, M.: *J. Chem. Soc., Perkin Trans. 2*, (2) 623-626 (1976).
- 1107 Nozawa, K.; Seyea, H.; Nakajima, S.; Udagawa, S. and Kawai, K.: *J. Chem. Soc., Perkin Trans 1*, (8) 1735-1738 (1987).
- 1108 Nye, M. J. and Scriven, E. F. V.: *Can. J. Chem.*, **49** (21) 3572-3574 (1971).
- 1109 Obara, H.; Onodera, J. and Shirasaki, F.: *Chem. Lett.*, (9) 1095-1098 (1980).
- 1110 Oelschlager, H.: *Arch. Pharm.*, **288**, 102-113 (1955).
- 1111 Oelschlager, H. and Moussa, O.: *Arch. Pharm. (Weinheim, Ger.)*, **306**, 807-812 (1973).
- 1112 Oganesyan, E. T.; Yakovenko, V. I.; Khachatryan, M. M.; Pershkov, S. R. and Cherevatyi, V. S.: *Khim.-Farm. Zh.*, **20** (6) 696-702 (1986); *Chem. Abstr.*, **105**, 126832c (1986).
- 1113 Ogawa, M.; Matsuda, H.; Eto, H.; Asaoka, T.; Kuraishi, T.; Iwasa, A.; Nakashima, T. and Yamaguchi, K.: *Chem. Pharm. Bull.*, **39** (9) 2301-2307 (1991).
- 1114 Ogle, C. R. and Main, L.: *J. Chem. Res., Synop.*, (11) 472-473 (2001).
- 1115 Ogle, C. R.: *M. Sc. Thesis; University of Waikato, New Zealand* (1996).
- 1116 Okada, M.; Inaoka, Y. and Tsuji, K.: *Jpn. Kokai Tokkyo Koho JP 07,206,644* [95,206,644] (1995); *Chem. Abstr.*, **123**, 296246d (1995).
- 1117 Okano, K. and Beppu, I.: *Bull. Agric. Chem. Soc. Jpn*, **15**, 110 (1939); *Chem. Abstr.*, **34**, 429<sup>4</sup> (1940).
- 1118 Okano, K. and Beppu, I.: *Nippon Nogei Kagaku Kaishi*, **15**, 645-652 (1939); *Chem. Abstr.*, **34**, 429<sup>4</sup> (1940).
- 1119 Oki, T.; Okubo, K. and Ishikawa, H.: *Mokuzai Gakkaishi*, **18** (12) 601-610 (1972); *Chem. Abstr.*, **78**, 73837y (1973).
- 1120 Okot-Kotber, B. M.; Morgan, T. D.; Hopkins, T. L. and Kramer, K. J.: *Insect. Biochem. Mol. Biol.*, **24** (8) 787-802 (1994).
- 1121 Okumura, K.: *Yakugaku Zasshi*, **80**, 525-532 (1960); *Chem. Abstr.*, **54**, 19659h (1960).
- 1122 Oliverio, A. and Lugli, E.: *Gazz. Chim. Ital.*, **78**, 16-20 (1948).
- 1123 Ollis, W. D. and Weight, D.: *J. Chem. Soc.*, 3826-3830 (1952).
- 1124 Omori, S. and Dence, C. W.: *Wood Sci. Technol.*, **15** (1) 67-69 (1981); *Chem. Abstr.*, **94**, 193907y (1981).
- 1125 Orito, I.: *Science Repts. Tohoku Imp. Univ., 1st. Ser.* **18**, 121-128 (1929); *Chem. Abstr.*, **24**, 98 (1930).
- 1126 Pacheco, H. and Grouiller, A.: *C. R. Acad. Sci.*, **256**, 3134-3136 (1963).
- 1127 Pakkal, R.; Thomas, II, F. D. and Fernelius, W. C.: *J. Org. Chem.*, **25**, 282-283 (1960).

- 1128 Palfreyman, M. G. and McDonald, I. A.: Eur. Pat. Appl. EP 66,518 (1982); Chem. Abstr., **98**, 179904w (1983).
- 1129 Palfreyman, M. G. and McDonald, I. A.: U.S. US 4,421,767 (1983); Chem. Abstr., **100**, 210421x (1984).
- 1130 Palmer, M. H. and Scollick, N. M.: J. Chem. Soc. C, **22**, 2833-2836 (1968).
- 1131 Pan, H. and Lundgren, L. N.: Phytochemistry, **39** (6) 1423-1428 (1995).
- 1132 Pan, H. and Lundgren, L. N.: Phytochemistry, **42** (4) 1185-1189 (1996).
- 1133 Panasencko, A. I.; Polyanskaya, N. L. and Starkov, S. P.: Zh. Obshch. Khim., **64** (4) 673-676 (1994).
- 1134 Paparao, C. and Sundaramurthy, V.: Indian J. Chem., Sect. B, **25B** (2) 212-214 (1986).
- 1135 Paparao, C.; Rao, K. V. and Sundaramurthy, V.: Synthesis, (3) 234-236 (1981).
- 1136 Paparao, C.; Rao, K. V. and Sundaramurthy, V.: Synthesis, (3) 236-237 (1981).
- 1137 Pardanani, N. H. and Trivedi, K. N.: J. Indian Chem. Soc., **49** (10) 1035-1039 (1972).
- 1138 Pardanani, N. H.; Shaikh, Y. A. and Trivedi, K. N.: J. Indian Chem. Soc., **52** (1) 45-46 (1975).
- 1139 Park, Chan-Ho and Givens, R. S.: J. Am. Chem. Soc., **119** (10) 2453-2463 (1997).
- 1140 Parmar, V. S.; Bisht, K. S.; Jain, R.; Singh, S.; Sharma, S. K.; Gupta, S.; Malhotra, S.; Tyagi, O. D.; Vardhan, A.; Pati, H. N.; van den Berghe, D. A. and Vlietinck, A. J.: Indian J. Chem., Sect. B: Org. Chem. Incl. Med. Chem., **35B** (3) 220-232 (1996).
- 1141 Parmar, V. S.; Gupta, S.; Sinha, R. and Sharma, S. K.: Indian J. Chem., Sect. B: **32B** (2) 244-256 (1993).
- 1142 Parmar, V. S.; Jain, R. and Singh, S.: Indian J. Chem., Sect. B, **26B** (4) 359-360 (1987).
- 1143 Parmar, V. S.; Jain, R. and Singh, S.: J. Chem. Res., Synop., (12) 404-405 (1987).
- 1144 Parmar, V. S.; Khanduri, C. H.; Tyagi, O. D.; Prasad, A. K.; Gupta, S.; Bisht, K. S.; Pati, H. N. and Sharma, N. K.: Indian J. Chem., Sect. **31B** (12) 925-929 (1992).
- 1145 Parmar, V. S.; Pati, H. N.; Azim, A.; Kumar, R.; Himanshu; Bisht, K. S.; Prasad, A. and Errington, W.: Bioorg. Med. Chem., **6** (1) 109-118 (1998).
- 1146 Parmar, V. S.; Prasad, A. K.; Sharma, N. K.; Bisht, K. S.; Pati, H. N. and Taneja, P.: Bioorg. Med. Chem. Lett., **3** (4) 585-588 (1993).
- 1147 Parmar, V. S.; Singh, S. and Jain, R.: Indian J. Chem., Sect. B, **26B** (5) 484-485 (1987).
- 1148 Parmar, V. S.; Singh, S. and Jain, R.: Indian J. Chem., Sect. B, **26B** (2) 166-167 (1987).
- 1149 Parthasarathy, M. R. and Gupta, Sushma: Indian J. Chem., Sect. B, **23B** (3) 227-230 (1984).
- 1150 Pasaribu, S. J. and Williams, L. R.: Aust. J. Chem., **26** (6) 1327-1331 (1973).
- 1151 Patel, P. J.; Messer, W. S. and Hudson, R. A.: J. Med. Chem., **36**, 1893-1901 (1993).
- 1152 Patel, P. J.; Wohlfeil, E. R.; Stahl, S. S.; McLaughlin, K. A. and Hudson, R. A.: Biochem. Biophys. Res. Commun., **175** (2) 407-413 (1991).
- 1153 Patel, S. V.; Patel, H. S. and Patel, S. R.: Angew. Makromol. Chem., **149**, 151-159 (1987).
- 1154 Pathak, V. P. and Khanna, R. N.: Gazz. Chim. Ital., **111** (1-2) 45-47 (1981).
- 1155 Pathak, V. P. and Khanna, R. N.: Synthesis, (11), 882-883 (1981).
- 1156 Patra, A.; Ghosh, G.; Sengupta, P. K. and Nath, S.: Magn. Reson. Chem., **25** (8) 734-736 (1987).
- 1157 Patwardhan, S. A. and Gupta, A. S.: J. Chem. Res., Synop. (12) 395, 3786-3794 (1984).
- 1158 Patwardhan, S. A. and Gupta, A. S.: Phytochemistry, **20** (6) 1458-1459 (1981).
- 1159 Patzlaff, M. and Barz, W.: Z. Naturforsch., **33c**, 675-684 (1978).
- 1160 Paulsen, A.: Medd. Norsk Farm. Selskap, **24** (4) 45-49 (1962); Chem. Abstr., **60**, 4047h (1964).
- 1161 Paulsen, A.: Medd. Norsk Farm. Selskap, **24** (4) 61-66 (1962); Chem. Abstr., **60**, 4048b (1964).
- 1162 Pavlickova, L.; Koutek, B.; Velek, J. and Soucek, M.: Collect. Czech. Chem. Commun., **39** (5) 1216-1219 (1974).
- 1163 Payne, T. G. and Jefferies, P. R.: Tetrahedron, **29**, 2575-2583 (1973).
- 1164 Peet, N. P.; Dickerson, G. A.; Abdallah, A. H.; Daly, J. W. and Ukena, D.: J. Med. Chem., **31** (10) 2034-2039 (1988).
- 1165 Pelter, A. and Foot, S.: Synthesis, (5) 326 (1976).
- 1166 Pelter, A.; Ward, R. S. and Ashdown, D. H. J.: Synthesis, (11) 843 (1978).

- 1167 Pelter, A.; Ward, R. S. and Bass, R. J.: *J. Chem. Soc., Perkin Trans. 1*, (6), 666-668 (1978).
- 1168 Pelter, A.; Ward, R. S. and Whalley, J. L.: *Environ. Toxicol. Pharmacol.*, **7** (3) 217-220 (1999); *Chem. Abstr.*, **131**, 334253d (1999).
- 1169 Pelter, A.; Ward, R. S. and Whalley, J. L.: *Synthesis*, (12) 1793-1802 (1998).
- 1170 Pendse, H. K.: *Rasayanam*, **2**, 131-134 (1956); *Chem. Abstr.*, **51**, 5063f (1957).
- 1171 Pera, John D.; Buckman, Stanley J.; Fenyes, Joseph G. E.; Flanagan, Kenneth J. and Pulido, Miguel L.: *Fr. Demande* 2,174,152 (1973); *Chem. Abstr.*, **80**, 120547g (1974).
- 1172 Perkin, A. G.: *J. Chem. Soc.*, **99**, 1721-1725 (1911).
- 1173 Perkin, A. G.: *J. Chem. Soc.*, **103**, 650-662 (1913).
- 1174 Perkin, A. G.: *J. Chem. Soc.*, **103**, 1632-1638 (1913).
- 1175 Phadke, P. S.; Rao, A. V. R. and Venkataraman, K.: *Indian J. Chem.*, **5** (4) 131-133 (1967).
- 1176 Pharmacia AS: *FR* 2,291,741 (1976); *Chem. Abstr.*, **85**, 159631 (1976).
- 1177 Pillion, R. E.: *U.S. US* 4,695,589 (1987); *Chem. Abstr.*, **109**, 54475w (1988).
- 1178 Piao, L. Z.; Park, H. R.; Park, Y. K.; Lee, S. K.; Park, J. H. and Park, M. K.: *Chem. Pharm. Bull.*, **50** (3) 309-311 (2002) and Park, J. H.: personal communication, March 31, 2004.
- 1179 Pichat, L. and Tostain, J.: *J. Labelled Compd. Radiopharm.*, **13** (4) 587-604 (1977); *Chem. Abstr.*, **88**, 136255m (1978).
- 1180 Pillai, K. M. R.; Kapil, R. S. and Anand, N.: *Indian J. Chem., Sect. B*: **30B** (2) 195-200 (1991).
- 1181 Pitet, G.; Couret, F.; Cousse, H. and Mouzin, G.: *Eur. Pat. Appl. EP* 36,357 (1981); *Chem. Abstr.*, **96**, 69052t (1982).
- 1182 Pivovarenko, V. G. and Khilya, V. P.: *Khim. Geterotsikl. Soedin.*, (5) 595-600 (1992); *Chem. Abstr.*, **118**, 212822z (1993).
- 1183 Pivovarenko, V. G. and Khilya, V. P.: *Khim. Geterotsikl. Soedin.*, (5) 625-631 (1991); *Chem. Abstr.*, **116**, 20893k (1992).
- 1184 Pivovarenko, V. G. and Khilya, V. P.: *Khim. Priir. Soedin.*, (2) 220-227 (1993); *Chem. Abstr.*, **124**, 56432p (1996).
- 1185 Pivovarenko, V. G.; Khilya, V. P. and Vasil'ev, S. A.: *Khim. Priir. Soedin.*, (5) 639-643 (1989); *Chem. Abstr.*, **113**, 59838q (1990).
- 1186 Pivovarenko, V. G.; Khilya, V. P.; Kovalev, V. N. and Vasil'ev, S. A.: *Khim. Priir. Soedin.*, (4) 511-519 (1988); *Chem. Abstr.*, **111**, 7693x (1989).
- 1187 Pivovarenko, V. G.; Khilya, V. P.; Kovalev, V. N. and Vasil'ev, S. A.: *Khim. Priir. Soedin.*, (4) 519-524 (1988); *Chem. Abstr.*, **111**, 39708x (1989).
- 1188 Pivovarenko, V. G.; Tuganova, A. V.; Osinskaya, L. F. and Kholodova, Yu. D.: *Khim.-Farm. Zh.*, **31** (3) 14-18 (1997); *Chem. Abstr.*, **128**, 140909q (1998).
- 1189 Polyanskaya, N. L.; Goncharenko, G. A.; Panasenko, A. I. and Starkov, S. P.: *Zh. Obshch. Khim.*, **65** (7) 1177-1179 (1995).
- 1190 Popoff, T. and Theander, O.: *Acta Chem. Scand., Ser. B*, **B30** (5) 397-402 (1976).
- 1191 Popova, Z. V.; Yanovskii, D. M.; Zil'berman, E. N.; Rybakova, N. A. and Ganina, V. I.: *Zh. Prikl. Khim.*, **34**, 874-881 (1961); *Chem. Abstr.*, **55**, 15994a (1961).
- 1192 Portnykh, N. V., Volod'kin, A. A. and Ershov, V. V.: *Izv. Akad. Nauk SSSR, Ser. Khim.*, **12**, 2243-2244 (1966); *Chem. Abstr.*, **66**, 85580z (1967).
- 1193 Postovskii, I. Ya.; Novikova, A. P.; Chechulina, L. A. and Sidorova, L. P.: *Khim. Geterotsikl. Soedin.*, **8**, 1051-1055 (1976); *Chem. Abstr.*, **85**, 177376h (1976).
- 1194 Prajapati, S. P. and Sethna, S.: *J. Indian Chem. Soc.*, **49** (4) 391-396 (1972).
- 1195 Prajapati, S. P. and Sethna, S.: *J. Indian Chem. Soc.*, **53** (3) 300-302 (1976).
- 1196 Prajapati, S. P.; Pardani, J. H. and Sethna, S.: *J. Indian Chem. Soc.*, **54** (10) 971-974 (1977).
- 1197 Prasad, V. K.; Ricci, R. A.; Nunning, B. C. and Granatek, A. P.: *J. Pharm. Sci.*, **62** (7) 1135-1140 (1973).
- 1198 Pratt, D. D. and Robinson, R.: *J. Chem. Soc.*, **123**, 745-758 (1923).
- 1199 Price, D. and Bogert, M. T.: *J. Am. Chem. Soc.*, **56**, 2442-2449 (1934).
- 1200 Price, P. and Israelstam, S. S.: *J. Org. Chem.*, **29** (9) 2800-2802 (1964).
- 1201 Priestley, Hill M. and Moness Eugene: *J. Org. Chem.*, **5**, 355-361 (1940).

- 1202 Primenko, B. A.; Romanenko, N. I.; Garmash, S. N.; Klyuev, N. A.; Fedulova, I. V.; Gnatov, N. I. and Koval, N. V.: *Ukr. Khim. Zh.*, **51** (6) 660-663 (1985).
- 1203 Procopiou, P. A.; Morton, G. E.; Todd, M. and Webb, G.: *Tetrahedron Asymmetry*, **12** (14) 2005-2008 (2001).
- 1204 Quijano, L.; Malanco, F. and Rios, T.: *Tetrahedron*, **26**, 2851-2859 (1970).
- 1205 Raaijmakers, J. M. and Weller, D. M.: *Mol. Plant-Microbe Interact.*, **11** (2) 144-152 (1998); *Chem. Abstr.*, **128**, 138692v (1998).
- 1206 Raaijmakers, J. M.; Weller, D. M. and Thomashow, L. S.: *Appl. Environ. Microbiol.*, **63** (3) 881-887 (1997); *Chem. Abstr.*, **126**, 248625y (1997).
- 1207 Raether, G.; Lebus, F.; Klopsh, D.; Katzorke, D. and Wollmann, H.: *Pharmazie*, **46** (6) 426-431 (1991).
- 1208 Rahman, W. and Nasim, K. T.: *J. Org. Chem.*, **27**, 4215-4220 (1962).
- 1209 Rahman, W. and Nasim, K. T.: *Tetrahedron Lett.*, **18**, 628-631 (1961).
- 1210 Rajagopalan, S.; Rangaswami, S. Rao, K. V. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **23A**, 60-66 (1946).
- 1211 Rajagopalan, S.; Rao, K. V. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **26A** (1) 18-21 (1947).
- 1212 Rajagopalan, S. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **28A** (2) 31-38 (1948).
- 1213 Raju, V. S.; Subbaraju, G. V.; Manhas, M. S.; Kaluza, Z. and Bose, A. K.: *Tetrahedron*, **48** (39) 8347-8352 (1992).
- 1214 Ramachandran, P. K.; Tefteller, A. T.; Paulson, G. O.; Cheng, T.; Lin, C. T. and Horton, W. J.: *J. Org. Chem.*, **28**, 398-403 (1963).
- 1215 Ramsden, C. A.; Knowles, P.; Lewis, E. J.; Lunt, E. and Wright, D. E.: *Ger. Offen.* 2,846,931 (1979); *Chem. Abstr.*, **91**, 74626j (1979).
- 1216 Rangaswami, S. and Rao, K. H.: *Proc. Indian Acad. Sci.*, **49A**, 241-249 (1959).
- 1217 Rangaswami, S. and Sastry, B. V. R.: *Proc. Indian Acad. Sci., Sect. A*, **57A** (3) 135-141 (1963).
- 1218 Rani, B. S. U. and Darbarwar, M.: *J. Indian Chem. Soc.*, **64** (9) 555-558 (1987).
- 1219 Ranisteano, S. and Bourdon, R.: *Brit. I.* 1,165,334 (1969); *Chem. Abstr.*, **72**, 12783g (1970).
- 1220 Rao, K. V. and Sundaramurthy, V.: *Indian J. Chem.*, **15B** (3) 236-237 (1977).
- 1221 Rao, K. V. and Sundaramurthy, V.: *Proc. Indian Acad. Sci.*, **83A** (6) 238-242 (1976).
- 1222 Rao, P. R. and Seshadri, T. R.: *Proc. Indian Acad. Sci.*, **24A** (5) 456-464 (1946).
- 1223 Rao, P. R. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **22A**, 157-162 (1945).
- 1224 Rao, P. R. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **27A**, 104-110 (1948).
- 1225 Rao, P. R.; Rao, P. S. and Seshadri, T. R.: *Proc. Indian Acad. Sci.*, **19A**, 88-92 (1944).
- 1226 Rao, P. S. and Hayon, E.: *J. Am. Chem. Soc.*, **96**, 1287-1294 (1974).
- 1227 Raphael, R. A.; Eyley, S. C. and Colman, S. C. W.: *Eur. Pat. Appl.* 30,423 (1981); *Chem. Abstr.*, **95**, 169008f (1981).
- 1228 Ray, A. B.; Dutta, S. C. and Dasgupta, S.: *Phytochemistry*, **15** (11) 1797-1798 (1976).
- 1229 Reddy, K. V. V.; Rao, P. S. and Ashok, D.: *Synth. Commun.*, **30** (10) 1825-1836 (2000).
- 1230 Reddy, M. S.; Reddy, C. R.; Krupadanam, G. L. D. and Srimannarayana, G.: *Indian J. Chem., Sect. B*, **28B** (12) 1057-1059 (1989).
- 1231 Reddy, S. P.; Ashok, D. and Sarma, P. N.: *J. Indian Chem. Soc.*, **68** (4) 242-243 (1991).
- 1232 Reichel, L.; Proksch, G. and Tobien, G.: *Justus Liebigs Ann. Chem.*, **10**, 1709-1712 (1974).
- 1233 Renuzov, A. L.: *Zh. Obshch. Khim.*, **28**, 2530-2538 (1958).
- 1234 Ricoh Co., Ltd.: *Jpn. Kokai Tokkyo Koho JP* 57,167,296 [82,167,296] (1982); *Chem. Abstr.*, **100**, 94556u (1984).
- 1235 Riegel, B. and Wittcoff, H.: *J. Am. Chem. Soc.*, **68**, 1913-1917 (1946).
- 1236 Riganesis, M. D.: *Chem. Zentralbl.*, **128**, 9793 (1957).
- 1237 Ritchie, E.; Taylor, W. L. and Vautin, S. T. K.: *Aust. J. Chem.*, **18**, 2021-2034 (1965).
- 1238 Robertson, A. and Robinson, R.: *J. Chem. Soc.*, 1460-1472 (1928).
- 1239 Robertson, A.; Suckling, C. W. and Whalley, W. B.: *J. Chem. Soc.*, 1571-1578 (1949).
- 1240 Robinson, R. and Venkataraman, K.: *J. Chem. Soc.*, 61-67 (1929).
- 1241 Rodriguez, F. and Pfender, W. F.: *Phytopathology*, **87** (6) 614-621 (1997); *Chem. Abstr.*, **127**, 106562t (1997).

- 1242 Roepstorff, P. and Andersen, S. O.: *Biomed. Mass Spectrom.*, **7** (7) 317-320 (1980).
- 1243 Romdhane, M.; Carrier, B.; Barrelle, M. and Beguin, C. G.: *Holzforschung*, **40**, 259-261 (1986).
- 1244 Rosenmund, K. W. and Kuhnhenh, W.: *Ber. Dtsch. Chem. Ges.*, **56**, 1266-1269 (1923).
- 1245 Rosenmund, W. and Lohfert, H.: *Ber. Dtsch. Chem. Ges.*, **61**, 2601-2607 (1928).
- 1246 Rosenmund, K. W. and Pfroepffer, K.: *Chem. Ber.*, **90**, 1922-1928 (1957).
- 1247 Rosenmund, K. W. and Schnurr, W.: *Justus Liebigs Ann. Chem.*, **460**, 56-98 (1928).
- 1248 Rosenmund, K. W. and Schulz, H.: *Arch. Pharm. Ber. Dtsch. Pharm. Ges.*, **265**, 308-319 (1927).
- 1249 Rosenmund, K. W.; Buchwald, R. and Deligiannis, T.: *Arch. Pharm. Ber. Dtsch. Pharm. Ges.*, **271**, 342-352 (1933).
- 1250 Rosenmund, K. W.; Kuhnhenh, W. and Lesch, W.: *Ber. Dtsch. Chem. Ges.*, **56**, 2042-2044 (1923).
- 1251 Row, L. R. and Rao, D. V.: *J. Sci. Ind. Res.*, **17B** (5) 199-202 (1958).
- 1252 Row, L. R. and Sastry, C. V. R.: *Tetrahedron*, **19**, 1371-1376 (1963).
- 1253 Row, L. R. and Seshadri, T. R.: *Proc. Indian Acad. Sci.*, **21A**, 155-161 (1945).
- 1254 Row, L. R. and Seshadri, T. R.: *Proc. Indian Acad. Sci.*, **22A**, 215-224 (1945).
- 1255 Row, L. R. and Seshadri, T. R.: *Proc. Indian Acad. Sci.*, **23A**, 23-36 (1946).
- 1256 Row, L. R. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **23A**, 140-146 (1946).
- 1257 Row, L. R.; Seshadri, T. R. and Thiruvengadam, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **29A**, 80-90 (1949).
- 1258 Roy, D. and Khanna, R. N.: *Indian J. Chem., Sect. B* **18B** (6) 525-528 (1979).
- 1259 Roy, N. K. and Chakravarti, N. N.: *J. Indian Chem. Soc.*, **40** (7) 601-602 (1963).
- 1260 Royer, R. and René, L.: *Bull. Soc. Chim. Fr.* (10), 3601-3609 (1970).
- 1261 Royer, R.; Bachelet, J. P. and Demerseman, P.: *Bull. Soc. Chim. Fr.*, 878-882 (1969).
- 1262 Rozum, Yu. S.: *Biokhimiya*, **17**, 476-479 (1952); *Chem. Abstr.*, **47**, 403g (1953).
- 1263 Rubin, Nathan and Day, Allan R.: *J. Org. Chem.*, **5**, 54-60 (1940).
- 1264 Ruenitz, P. C.; Bagley, J. R.; Watts, C. K. W.; Hall, R. E. and Sutherland, R. L.: *J. Med. Chem.*, **29** (12) 2511-2519 (1986).
- 1265 Russo, U.; Zarli, B.; Zanonato, P. and Vidali, M.: *Polyhedron*, **10** (12) 1353-1361 (1991).
- 1266 Rybakova, N. A. and Zil'berman, E. N.: *Zh. Obshch. Khim.*, **31** (4) 1272-1275 (1961).
- 1267 Saburi, Y.; Yoshimoto, T. and Minami, K.: *Nippon Kagaku Kaishi*, (4) 754-757 (1973); *Chem. Abstr.*, **79**, 4609j (1973).
- 1268 Sachchar, S. P. and Singh, A. K.: *Indian J. Pharm. Sci.*, **48** (1) 1-4 (1986); *Chem. Abstr.*, **106**, 119394d (1987).
- 1269 Sachs, R.: *F. P.* 851 296 (1938); *Chem. Zentralbl. II*, 1077 (1940).
- 1270 Sachs, R.: *F. P.* 866 570 (1939); *Chem. Zentralbl. II*, 1967 (1942).
- 1271 Saeed, A.; Sharma, A. P.; Durani, N.; Jain, R.; Durani, S. and Kapil, R. S.: *J. Med. Chem.*, **33** (12) 3210-3216 (1990).
- 1272 Saengchantara, S. T. and Wallace, T. W.: *J. Chem. Soc., Chem. Commun.*, (21) 1592-1595 (1986).
- 1273 Saengchantara, S. T. and Wallace, T. W.: *Tetrahedron*, **46** (8) 6553-6564 (1990).
- 1274 Saito, S.: *Japan* 3972 (1952); *Chem. Abstr.*, **48**, 4586i (1954).
- 1275 Saito, S.; Kawazu, M.; Kugita, H. and Kinoshita, H.: *Tanabe Seiyaku Kenkyû Nempô*, **2**, 7-9 (1957); *Chem. Abstr.*, **52**, 1094d (1958).
- 1276 Samula, K. and Jurkowska-Kowalczyk, E.: *Pol.* 70,479 (1974); *Chem. Abstr.*, **82**, 57567n (1975).
- 1277 Sanchez-Viesca, F. and Berros, M. I.: *Rev. Latinoamer. Quim.*, **29** (2) 73-79 (2001).
- 1278 Sanduja, R.; Weinheimer, A. J. and Alam, M.: *J. Chem. Res., Synop.* (2) 56-57 (1985).
- 1279 Sandulache, A.; Cascaval, A.; Toniutti, N. and Giumanini, A. G.: *Tetrahedron*, **53** (28) 9813-9822 (1997).
- 1280 Sangwan, N. K. and Rastogi, S. N.: *Indian J. Chem.*, **20B** (6) 480-483 (1981).
- 1281 Sangwan, N. K.; Verma, B. S. and Dhindsa, K. S.: *Indian J. Chem.*, **25B** (6) 672-674 (1986).
- 1282 Sangwan, N. K.; Verma, B. S.; Malik, O. P. and Dhindsa, K. S.: *Indian J. Chem., Sect. B*: **29B** (3) 294-296 (1990).

- 1283 SanMartin, R.; Martinez de Marigorta, E. and Dominguez, E.: *Tetrahedron*, **50** (7) 2255-2264 (1994).
- 1284 Saraf, A. S. and Simonyan, A. V.: *Khim.-Farm. Zh.*, **26** (7-8) 45-48 (1992); *Chem. Abstr.*, **119**, 159802k (1993).
- 1285 Saraiya, P. R. and Shah, R. C.: *Proc. Indian Acad. Sci.*, **31**, 213-223 (1950).
- 1286 Sartori, G.; Casnati, G.; Bigi, F. and Predieri, G.: *J. Org. Chem.*, **55**, 4371-4377 (1990).
- 1287 Sasaki, Norio; Kudo, Sachio; Endo, Keiji and Suzuki, Rika: *Jpn. Kokai Tokkyo Koho JP 04 77,487* [92 77,487] (1992); *Chem. Abstr.*, **117**, 145331c (1992).
- 1288 Sastri, V. D. N. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **24A**, 238-242 (1946).
- 1289 Sato, S.; Kubota, Y.; Kumagai, H.; Kumazawa, Y.; Matsuba, S.; Onodera, Jun-Ichi and Suzuki, M.: *Heterocycles*, **53** (7) 1523-1532 (2000).
- 1290 Saul, S. J. and Sugumaran, M.: *J. Biol. Chem.*, **265** (28) 16992-16999 (1990).
- 1291 Saxena, S.; Jain, P. K.; Makrandi, J. K. and Grover, S. K.: *Tetrahedron Lett.*, **24** (32) 3401-3402 (1983).
- 1292 Saxena, V. K. and Shrivastava, P.: *Asian J. Chem.*, **7** (1) 157-160 (1995); *Chem. Abstr.*, **122**, 128669e (1995).
- 1293 Schäfer, W.; Leute, R. and Schlude, H.: *Chem. Ber.*, **104** (10) 3211-3221 (1971).
- 1294 Schenck, G.; Huke, M. and Görlitzer, K.: *Tetrahedron Lett.*, (19) 2375-2378 (1968).
- 1295 Schenck, G.; Huke, M. and Görlitzer, K.: *Tetrahedron Lett.*, (22) 2059-2061 (1967).
- 1296 Schmid, L. and Tadros, F.: *Ber. Dtsch. Chem. Ges.*, **65**, 1689-1691 (1932).
- 1297 Schmiz, C. and Eiden, F.: *Liebigs Ann. Chem.*, **12**, 2021-2030 (1980).
- 1298 Schoot, C. J. and Klassens, K. H.: *Recl. Trav. Chim. Pays-Bas*, **75**, 190-192 (1956).
- 1299 Schöpf, C. and Heuck, K.: *Justus Liebigs Ann. Chem.*, **459**, 233-286 (1927).
- 1300 Schöpf, C. and Ross, F.: *Justus Liebigs Ann. Chem.*, **546**, 1-40 (1941).
- 1301 Schuda, P. F. and Price, W. A.: *J. Org. Chem.*, **52** (10) 1972-1979 (1987).
- 1302 Seevers, R. H.; Mease, R. C.; Friedman, A. M. and Desombre, E. R.: *Nucl. Med. Biol.*, **13** (4) 485-495 (1986); *Chem. Abstr.*, **106**, 119359w (1987).
- 1303 Segalle, R.: *Monatsh. Chem.*, **17**, 314-326 (1896).
- 1304 Sehgal, J. M. and Seshadri, T. R.: *Proc. Indian Acad. Sci., Sect. A*, **42A** (1) 36-40 (1955).
- 1305 Sejbal, J. and Krecek, V.: *Czech. CS 274,244* (1992); *Chem. Abstr.*, **119**, 138986h (1993).
- 1306 Sekiya, M.; Morimoto, T. and Suzuki, K.: *Chem. Pharm. Bull.*, **21** (6) 1213-1217 (1973).
- 1307 Seliger, H.; Happ, E.; Cascaval, A.; Birsa, M. L. and Novitschi, G.: *An. Stiint. Univ. "Al. I. Cuza" Iasi, Chim.*, **5**, 111-122 (1997); *Chem. Abstr.*, **132**, 207731d (2000).
- 1308 Seliger, H.; Happ, E.; Cascaval, A.; Birsa, M. L. and Novitschi, G.: *An. Stiint. Univ. "Al. I. Cuza" Iasi, Chim.*, **5**, 123-128 (1997); *Chem. Abstr.*, **132**, 207793a (2000).
- 1309 Semechkina, A. F. and Shorygina, N. N.: *Izv. Akad. Nauk. SSSR, Ser. Khim.*, **5**, 884-890 (1964).
- 1310 Sen, A. B. and Bhargava, P. M.: *J. Indian Chem. Soc.*, **26** (8) 366-370 (1949).
- 1311 Sen, A. B. and Gupta, A. K.: *J. Indian Chem. Soc.*, **33** (6) 437-439 (1956).
- 1312 Sen, A. B. and Singh, S. B.: *J. Indian Chem. Soc.*, **41** (6) 461-464 (1964).
- 1313 Sen, A. B. and Tiwari, S. S.: *J. Indian Chem. Soc.*, **29** (6) 419-424 (1952).
- 1314 Sen, A. K.; Mahato, S. B. and Dutta, N. L.: *Indian J. Chem., Sect. B*: **14B** (11) 849-851 (1976).
- 1315 Sen, N. K.; Ghosh, P. C.; Kundu, A. B. and Chatterjee, A.: *Chem. Ber.*, **104**, 3425-3428 (1971).
- 1316 Sergovskaya, N. L.; Komienko, N. I.; Shekhter, O. V. and Tsizin, Yu. S.: *Zh. Org. Khim.*, **18** (10) 2167-2170 (1982).
- 1317 Seshadri, T. R. and Varadarajan, S.: *Proc. Indian Acad. Sci., Sect. A*, **37A** (1) 145-158 (1953).
- 1318 Seshadri, T. R. and Varadarajan, S.: *Proc. Indian Acad. Sci., Sect. A*, **37A** (4) 508-513 (1953).
- 1319 Seshadri, T. R. and Varadarajan, S.: *Proc. Indian Acad. Sci., Sect. A*, **37A** (4) 514-519 (1953).
- 1320 Seshadri, T. R. and Varadarajan, S.: *Proc. Indian Acad. Sci., Sect. A*, **37A** (4) 526-530 (1953).

- 1321 Seshadri, T. R. and Varadarajan, S.: *Proc. Indian Acad. Sci., Sect. A*, **37A** (6) 784-797 (1953).
- 1322 Seshadri, T. R. and Venkateswarlu, V.: *Proc. Indian Acad. Sci., Sect. A*, **23A**, 192-208 (1946).
- 1323 Seshadri, T. R. and Venkateswarlu, V.: *Proc. Indian Acad. Sci., Sect. A*, **23A**, 209-212 (1946).
- 1324 Seshadri, T. R. and Venkateswarlu, V.: *Proc. Indian Acad. Sci., Sect. A*, **24A** (4) 349-351 (1946).
- 1325 Shah, H. A. and Shah, R. C.: *J. Chem. Soc.*, 245-247 (1940).
- 1326 Shah, H. A. and Shah, R. C.: *J. Indian Chem. Soc.*, **17**, 32-36 (1940).
- 1327 Shah, R. C. and Mehta, P. R.: *J. Univ. Bombay*, **4**, 109-113 (1935).
- 1328 Shah, R. R. and Trivedi, K. N.: *J. Indian Chem. Soc.*, **58** (3) 302-305 (1981).
- 1329 Shaikh, Y. A. and Trivedi, K. N.: *Indian J. Chem.*, **12** (12) 1262-1263 (1974).
- 1330 Shamma, M. and Stiver, L. D.: *Tetrahedron*, **25** (17) 3887-3893 (1969).
- 1331 Shao, Guo-Xian; Mo, Ruo-Ying; Wang, Cun-Ying; Zhang, De-Yong; Yin, Zhong-Zhu; Ouyang, Rong and Xu, Li-Na: *Yao Hsueh Hsueh Pao*, **15** (9) 538-547 (1980); *Chem. Abstr.*, **94**, 174809b (1981).
- 1332 Sharghi, Hashem and Kaboudin, Babak: *J. Chem. Res., Synop.*, (10) 628-629, 2678-2695 (1998).
- 1333 Sharifi-Tehrani, A.; Zala, M.; Natsch, A.; Moenne-Loccoz, Y. and Defago, G.: *Eur. J. Plant Pathol.*, **104** (7) 631-643 (1998); *Chem. Abstr.*, **130**, 120833y (1999).
- 1334 Sharma, A. P.; Saeed, A.; Durani, S. and Kapil, R. S.: *J. Med. Chem.*, **33** (12) 3216-3222 (1990).
- 1335 Sharma, A. P.; Saeed, A.; Durani, S. and Kapil, R. S.: *J. Med. Chem.*, **33** (12) 3222-3229 (1990).
- 1336 Sharma, P. K.; Khanna, R. N. and Pathak, V. P.: *Acta Chim. Hung.*, **112** (1) 27-29 (1983); *Chem. Abstr.*, **99**, 105024h (1983).
- 1337 Sharma, P. V. and Khanna, R. N.: *Acta Chim. Hung.*, **120** (12) 159-162 (1985); *Chem. Abstr.*, **105**, 171584j (1986).
- 1338 Sharma, V. K. and Bannerjee, N. R.: *Bull. Soc. Chim. Fr.*, (3) 364-366 (1986).
- 1339 Sharma, V. K. and Bannerjee, N. R.: *Bull. Soc. Chim. Fr.*, (3) 424-426 (1987).
- 1340 Sharpe, C. J.; Shadbolt, R. S.; Ashford, A. and Ross, J. W.: *J. Med. Chem.*, **14** (10) 977-982 (1971).
- 1341 Shaw, S. C.; Gupta, A. K. and Kumar, R.: *J. Indian Chem. Soc.*, **68** (11) 615-616 (1991).
- 1342 Shaw, S. C.; Srivastava, B. K. and Jha, U.: *J. Indian Chem. Soc.*, **67** (2) 144-147 (1990).
- 1343 Shekhter, O. V.; Sergovskaya, N. L.; Tsizin, Yu. S.; Pridantseva, E. A. and Alekseev, A. N.: *U.S.S.R. SU* 881,098 (1981); *Chem. Abstr.*, **96**, 138025a (1982).
- 1344 Shetty, U. U. and Nelson, W. L.: *J. Med. Chem.*, **31** (1) 55-59 (1988).
- 1345 Shi, Chuntong and Wang, Shengfu: *Zhongguo Haiyang Yaowu*, **9** (3) 10-11 (1990); *Chem. Abstr.*, **115**, 92016d (1991).
- 1346 Shiao, Daniel D.: *US Pat.*, US 4,138,265 (1979); *Chem. Abstr.*, **90**, 195616u (1979).
- 1347 Shibata, S.; Murata, T. and Fujita, M.: *Chem. Pharm. Bull.*, **11** (3) 382-385 (1963).
- 1348 Shigematsu, N.; Kouno, I. and Kawano, N.: *Phytochemistry*, **22** (1) 323-325 (1983).
- 1349 Shindo, H. and Imune, Y.: *Jpn. Kokai Tokkyo Koho JP* 2000 290,202 (2000); *Chem. Abstr.*, **133**, 296035r (2000).
- 1350 Shirasaka, Tetsuhiko; Ishikawa, Hiroshi; Yasamura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio and Tsuji, Koichi: *Eur. Pat. Appl. EP* 435,333 (1991); *Chem. Abstr.*, **115**, 279695s (1991).
- 1351 Shopper, C. W.; Craig, J. C. and Lack, R. E.: *J. Chem. Soc.*, 2291-2298 (1961).
- 1352 Shriner, R. L. and Grosser, F.: *J. Am. Chem. Soc.*, **64**, 382-384 (1942).
- 1353 Shriner, R. L. and Hull, C. J.: *J. Org. Chem.*, **10**, 228-231 (1945).
- 1354 Shriner, R. L. and Hull, C. J.: *J. Org. Chem.*, **10**, 288-291 (1945).
- 1355 Shriner, R. L. and Moffett, R. B.: *J. Am. Chem. Soc.*, **63**, 1694-1698 (1941).
- 1356 Shriner, R. L. and Witte, M.: *J. Am. Chem. Soc.*, **61**, 2328-2329 (1939).
- 1357 Shriner, R. L.; Matson, E. D. and Damschroder, R. E.: *J. Am. Chem. Soc.*, **61**, 2322-2327 (1939).
- 1358 Sicker, D.: *J. Prakt. Chem.*, **332** (3) 336-344 (1990).

- 1359 Sicker, D.; Hoffmann, K.; Goetz, L. and Mann, G.: Ger. (East) DD 288,602 (1991); Chem. Abstr., **115**, 159191c (1991).
- 1360 Sigstad, E.; Catalan, C. A. N.; Diaz, J. G. and Herz, W.: *Phytochemistry*, **33** (1) 165-169 (1993).
- 1361 Silten, E.: DE 541,475 (1930); Chem. Abstr., **26**, 1943 (1932).
- 1362 Sim, K. Y.: J. Chem. Soc. (C) 976-979 (1967).
- 1363 Simonoff, R. and Hartung, W. H.: J. Am. Pharm. Assoc., **35** (10) 306-309 (1946).
- 1364 Singh, H.; Jain, P. K.; Makrandi, J. K. and Grover, S. K.: Indian J. Chem., Sect. B, **21B** (6) 547-548 (1982).
- 1365 Singh, J. M.: Can. J. Chem., **46**, 1168-1169 (1968).
- 1366 Singh, O. V.; Sangeeta; Khanna, M. S.; Garg, C. P.; Kapoor, R. P.; Kapil, A. and Sharma, S.: Indian J. Chem., Sect. B: **32B** (12) 1241-1248 (1993).
- 1367 Sipos, Gyorgy v. and Szabo, Rozsa: Acta Phys. Chem. Szeged, **7**, 126-128 (1961).
- 1368 Skidmore, I. F.; Naylor, A.; Finch, H.; Lunts, L. H. C. and Campbell, I. B.: Eur. Pat. Appl. EP 303,465 (1989); Chem. Abstr., **111**, 23406m (1989).
- 1369 Skraup, S. and Binder, O.: Ber. Dtsch. Chem. Ges., **62**, 1127-1138 (1929).
- 1370 Skraup, S. and Poller, K.: Ber. Dtsch. Chem. Ges., **57**, 2033-2038 (1924).
- 1371 Slater, W. K. and Stephen, H.: J. Chem. Soc., **117**, 309-318 (1920).
- 1372 Smith, B. L.; Mueller, W. H. and Strutz, H.: Eur. Pat. Appl. EP 449,602 (1991); Chem. Abstr., **115**, 255804a (1991).
- 1373 Smith, D. S.; Winnick, J.; Ding, Y. and Bottomley, L. A.: Electrochim. Acta, **43** (3-4) 335-339 (1998); Chem. Abstr., **128**, 146646y (1998).
- 1374 Smith, T. J.; Wearne, R. H. and Wallis, A. F. A.: Chemosphere, **30** (1) 69-80 (1995).
- 1375 Sohda, S.; Fujimoto, M.; Tamegai, T. and Hirose, N.: J. Med. Chem., **22** (3) 279-286 (1979).
- 1376 Sokolov, E. I.; Zanina, A. S. and Kotlyarevskii, I. L.: Vysokomol. Soedin, Ser. B **14** (4) 311-314 (1972); Chem. Abstr., **77**, 48843u (1972).
- 1377 Song, Yan Nong; Shibuya, M.; Ebizuka, Y. and Sankawa, U.: Chem. Pharm. Bull., **38** (7) 2063-2065 (1990).
- 1378 Song, Yan Nong; Shibuya, M.; Ebizuka, Y. and Sankawa, U.: Chem. Pharm. Bull., **39** (9) 2347-2350 (1991).
- 1379 Song, Yan Nong; Shibuya, M.; Ebizuka, Y. and Sankawa, U.: Chem. Pharm. Bull., **39** (10) 2613-2616 (1991).
- 1380 Sonn, A. and Falkenheim, S.: Ber. Dtsch. Chem. Ges., **55**, 2975-2985 (1922).
- 1381 Sonn, A.: Ber. Dtsch. Chem. Ges., **50**, 1262-1270 (1917).
- 1382 Soon, A.: Ber. Dtsch. Chem. Ges., **52**, 923-928 (1919).
- 1383 Späth, E. and Lederer, E.: Ber. Dtsch. Chem. Ges., **63**, 743-748 (1930).
- 1384 Späth, E. and Schläger, J.: Ber. Dtsch. Chem. Ges., **73B**, 1-12 (1940).
- 1385 Späth, E. and Schmidt, O.: Monatsh. Chem., **53**, 454-470 (1929).
- 1386 Spencer, P. A. and Towers, G. H. N.: *Phytochemistry*, **30** (9) 2933-2937 (1991).
- 1387 Spivack, J.; Leib, T. K. and Lobos, J. H.: J. Biol. Chem., **269** (10) 7323-7329 (1994).
- 1388 Sprecher, A. v. and Beck, A.: Eur. Pat. Appl. EP 333,315 (1989); Chem. Abstr., **112**, 118648b (1990).
- 1389 Spyroudis, S. and Tarantilli, P.: Tetrahedron, **50** (39) 11541-11552 (1994).
- 1390 Sreenivasulu, B. and Sarma, P. N.: Synth. Commun., **26** (18) 3373-3381 (1996).
- 1391 Sreenivasulu, B.; Sundaramurthy, V. and Subba Rao, N. V.: Proc. Indian Acad. Sci., Sect. A, **80** (6) 273-277 (1974).
- 1392 Sridar, V. and Rao, V. S. S.: J. Photochem. Photobiol., A: Chem., **69**, 325-327 (1993).
- 1393 Srivastava, A. K. and Bahel, S. C.: J. Indian Chem. Soc., **53** (8) 841-845 (1976).
- 1394 Srivastava, K. M. and Gupta, P. C.: Chim. Acta Turc., **22** (1) 31-45 (1994); Chem. Abstr., **122**, 213880m (1995).
- 1395 Srivastava, P.; Pandey, V. C.; Misra, A. P.; Gupta, P.; Raj, K. and Bhaduri, A. P.: Bioorg. Med. Chem., **6** (2) 181-187 (1998).
- 1396 Stachel, S. E.; Messens, E.; Van Montagu, M. and Zambryski, P.: Nature (London) **318**, 624-629 (1985).
- 1397 Stavber, S.: personal communication, June 22, 2001.
- 1398 Stavber, S.; Jereb, M. and Zupan, M.: Chem. Commun. (Cambridge), (5) 488-489 (2002).



- 1399 Stavber, S.; Jereb, M. and Zupan, M.: *Chem. Commun. (Cambridge)*, (14), 1323-1324 (2000).
- 1400 Stearns & Co.: US 1,926,952 (1928).
- 1401 Stefanyl, David and Howard, Wm. L.: *J. Org. Chem.*, **20**, 813-818 (1955).
- 1402 Stephen, H. and Weizmann, C.: *J. Chem. Soc., Trans.*, **105** (1) 1046-1057 (1914).
- 1403 Sterling Drug, Inc.: Brit. 1,544,872 (1979); *Chem. Abstr.*, **92**, 163686s (1980).
- 1404 Stolz, F.: *Ber. Dtsch. Chem. Ges.*, **37**, 4149-4154 (1904).
- 1405 Stoughton, R. W.; Baltzly, R. and Bass, A.: *J. Am. Chem. Soc.*, **56**, 2007-2008 (1934).
- 1406 Strassner, T.: *Can. J. Chem.*, **75** (7) 1011-1022 (1997).
- 1407 Subba Rao, N. V.: *Khim. Geterotsikl. Soedin.*, (3) 291-310 (1977).
- 1408 Sugasawa, S. and Kawasu, M.: *J. Pharm. Soc. Jpn.*, **73**, 1102-1105 (1953).
- 1409 Sugasawa, T.; Toyoda, T. and Sasakura, K.: *PCT Int. Appl. WO 81 02,157* (1981); *Chem. Abstr.*, **96**, 34864g (1982).
- 1410 Suginome, H.: *J. Org. Chem.*, **23**, 1044-1046 (1958).
- 1411 Sugumaran, M.; Hennigan, B.; Semensi, V. and Dali, H.: *Arch. Insect. Biochem. Physiol.*, **8** (2) 89-100 (1988); *Chem. Abstr.*, **109**, 207064p (1988).
- 1412 Suzuki, T.; Nakai, H.; Akyama, T.; Matsumura, T.; Sasaki, M. and Kamimura, J.: *Jpn. Kokai Tokkyo Koho JP 05,297,585 [93,297,585]* (1993); *Chem. Abstr.*, **120**, 335034t (1994).
- 1413 Suzuki, T.; Tanemura, K.; Horaguchi, T. and Shimizu, T.: *J. Chem. Res., Synop.* (3) 132-133 (1996).
- 1414 Suzuki, T.; Yano, A.; Okada, M. and Ishii, Y.: *Nippon Kagaku Zasshi*, **81** (2) 301-305 (1960); *Chem. Abstr.*, **56**, 434e (1962).
- 1415 Swart, P.; van der Merwe, K. J.; Swart, A. C.; Todres, P. C. and Hofmeyr, J. H. S.: *Planta Med.*, **59** (2) 139-143 (1993).
- 1416 Szabo, V. and Kiss, A.: *Acta Chim. Hung.*, **113** (2) 193-199 (1983); *Chem. Abstr.*, **99**, 175539d (1983).
- 1417 Szabo, V. and Kiss, A.: *Magy. Kem. Foly.*, **85** (8) 353-356 (1979); *Chem. Abstr.*, **92**, 110775p (1980).
- 1418 Szabo, V. and Levai, A.: *Acta Phys. Chim. Debrecina*, **15/16**, 181-189 (1970); *Chem. Abstr.*, **76**, 3506z (1972).
- 1419 Szabo, V.; Borbely, S.; Farkas, E. and Tolnai, S.: *Magy. Kem. Foly.*, **81** (5) 220-224 (1975); *Chem. Abstr.*, **83**, 79033h (1975).
- 1420 Szabo, V.; Grishko, L. G.; Borbely, S. and Khilya, V. P.: *Khim. Geterotsikl. Soedin.* (2) 174-179 (1975); *Chem. Abstr.*, **82**, 170600f (1975).
- 1421 Szabo, V.; Kiss, A.; Poka, I. and Szabo, G.: *Magy. Kem. Foly.*, **81** (5) 224-226 (1975); *Chem. Abstr.*, **83**, 79030e (1975).
- 1422 Szegö, L. and Ostinelli, P.: *Gazz. Chim. Ital.*, **60**, 677-688 (1930).
- 1423 Tada, M.; Takahuwa, T.; Nagai, M. and Yoshii, T.: *Agric. Biol. Chem.*, **54** (11) 3061-3063 (1990); *Chem. Abstr.*, **114**, 94636j (1991).
- 1424 Tadros, W.; Ekladnis, L. and Sakla, A. B.: *J. Chem. Soc.*, 2351-2353 (1954).
- 1425 Tafesh, A. M.; Fruchey, O. S.; Hilton, C. B. and Mueller, W. H.: *PCT Int. Appl. WO 93 01,158* (1993); *Chem. Abstr.*, **119**, 95101w (1993).
- 1426 Tafesh, A. M.; Kvakovszky, G. and Lindley, C. R.: *U.S. US 5,349,090* (1994); *Chem. Abstr.*, **121**, 280383u (1994).
- 1427 Tafesh, A. M.; McDonough, J. A. and Mott, G. N.: *Eur. Pat. Appl. EP 491,557* (1992); *Chem. Abstr.*, **117**, 150677z (1992).
- 1428 Tajana, A.; Rossi, S. and Salvaterra, M.: *Arzneim. Forsch.*, **21** (11) 1661-1662 (1971).
- 1429 Takahashi, K. and Takani, M.: *Chem. Pharm. Bull.*, **26** (11) 3585-3587 (1978).
- 1430 Takai, M.; Yamaguchi, H.; Saitoh, T. and Shibata, S.: *Chem. Pharm. Bull.*, **20** (11) 2488-2490 (1972).
- 1431 Takashima, M.; Satomura, M.; Iwakura, K. and Kurihara, N.: *Jpn. Kokai Tokkyo Koho JP 62,280,074 [87,280,074]* (1987); *Chem. Abstr.*, **109**, 83599v (1988).
- 1432 Takasugi, M. and Matsuda, T.: *Phytochemistry*, **43** (5) 1019-1021 (1996).
- 1433 Takasuka, M. and Matsui, Y.: *J. Chem. Soc., Perkin Trans. 2*, (12) 1743-1750 (1979).
- 1434 Takats, Peter; Laufer, Laszlo; Homoki and Radetzky, Odon: *Hung. Teljes HU 64,926* (1994); *Chem. Abstr.*, **122**, 15794y (1995).

- 1435 Takeuchi, Y.; Watanabe, I.; Misumi, K.; Irie, M.; Hirose, Y.; Hirata, K.; Yamato, M. and Harayama, T.: *Chem. Pharm. Bull.*, **45** (12) 2011-2015 (1997).
- 1436 Tamai, T.; Tanaka, N.; Muranaka, H.; Mukaiyama, H.; Hirabayashi, A.; Sato, M. and Akahane, M.: *PCT Int. Appl. WO 99 05,090* (1999); *Chem. Abstr.*, **130**, 139170b (1999).
- 1437 Tamao, M. and Terashima, N.: *Mokuzai Gakkaishi*, **15** (3) 120-125 (1969); *Chem. Abstr.*, **71**, 103330c (1969).
- 1438 Tambor, J. and Du Bois, E. M.: *Ber. Dtsch. Chem. Ges.*, **51**, 748-751 (1918).
- 1439 Tambor, J.: *Ber. Dtsch. Chem. Ges.*, **43**, 1882-1889 (1910).
- 1440 Tanaka, H.; Stohlmeyer, M. M.; Wandless, T. J. and Taylor, L. P.: *Tetrahedron Lett.*, **41** (50) 9735-9739 (2000).
- 1441 Tanaka, T.; Sakurai, Y.; Okazaki, H.; Hasegawa, T. and Fukuyama, Y.: *Eur. Pat. Appl. EP 382,213* (1990); *Chem. Abstr.*, **114**, 81225z (1991).
- 1442 Tarbell, D. S. and Fanta, Paul E.: *J. Am. Chem. Soc.*, **65**, 2169-2174 (1943).
- 1443 Tasaki, T.: *Acta phytochimica*, **3**, 259-315 (1927).
- 1444 Tasaki, T.: *Chem. Zentralbl.*, **II**, 1949-1951 (1927).
- 1445 Tedder, J. M. and Theaker, G.: *J. Chem. Soc.*, 257-262 (1959).
- 1446 Temple, D. M.: *Aust. J. Chem.*, **20**, 601-604 (1967).
- 1447 Teng, L. C.; Walsh, D. A. and Shanklin, J. R., Jr.: *U.S. US 5,070,087* (1991); *Chem. Abstr.*, **116**, 151575f (1992).
- 1448 Teo, C. C.; Kon, O. L. and Sim, K. Y.: *J. Chem. Res., Synop.*, (1), 4-5, 171-184 (1990).
- 1449 Teo, C.-C. and Sim, K.-Y.: *Bull. Singapore Natl. Inst. Chem.*, **22**, 69-74 (1994); *Chem. Abstr.*, **123**, 313681m (1995).
- 1450 Terashima, N.; Tamao, M. and Kanda, T.: *Mokuzai Gakkaishi*, **14** (4) 220-226 (1968); *Chem. Abstr.*, **70**, 21099z (1969).
- 1451 Tetaz, F.; Barrelle, M.; Beguin, C. G. and Pelmont, J.: *New J. Chem.*, **15** (7) 587-591 (1991).
- 1452 Thakar, K. A. and Deshpande, G. D.: *Indian J. Chem.*, **10** (11) 1065-1067 (1972).
- 1453 Thea, S. and Cevasco, G.: *J. Org. Chem.*, **53** (17) 4121-4122 (1988).
- 1454 Thies, H. and Özbilici, Z.: *Arch. Pharm. Ber. Dtsch. Pharm. Ges.*, **295**, 194-196 (1962).
- 1455 Thomashow, L. S.; Banger, M. G.; Bonsall, R. F.; Kim, D.-S.; Raaijmakers, J. and Weller, D. M.: *Biol. Plant-Microbe Interact., Proc. Int. Symp. Mol. Plant-Microbe Interact.*, 8 th, 469-474 (1996); *Chem. Abstr.*, **126**, 313564n (1997).
- 1456 Thomashow, L. S.; Banger, M. G.; Weller, D. M. and Cook, J. R.: *PCT Int. Appl. WO 97 01,572* (1997); *Chem. Abstr.*, **126**, 167493v (1997).
- 1457 Thorwart, W.; Gebert, U.; Schleyerbach, R. and Bartlett, R.: *Eur. Pat. Appl. EP 276,805* (1988); *Chem. Abstr.*, **110**, 75574p (1989).
- 1458 Tiecco, M.; Testaferri, L.; Tingoli, M. and Bartoli, D.: *J. Org. Chem.*, **55** (15) 4523-4528 (1990).
- 1459 Tokes, A. L. and Bogner, R.: *Flavonoids Bioflavonoids, Proc. Hung. Bioflavonoid Symp.*, 5th 151-158 (1977); *Chem. Abstr.*, **89**, 43023q (1978).
- 1460 Tokes, A. L.; Bogner, R. and Cserenyak, E. K.: *Acta Chim. Sci. Hung.*, **99** (3) 337-339 (1979).
- 1461 Tolkunov, S. V. and Dulenko, V. I.: *Khim. Geterotsikl. Soedin.*, (6) 766-769 (1987); *Chem. Abstr.*, **108**, 112154h (1988).
- 1462 Torres-Lapasio, J. R.; Villanueva-Camanas, R. M.; Sanchis-Mallols, J. M.; Medina-Hernandez, M. J. and Garcia-Alvarez-Coque, M. C.: *J. Chromatogr., A* **677** (2) 239-253 (1994).
- 1463 Torrey, H. A. and Kipper, H. B.: *J. Am. Chem. Soc.*, **30**, 837-861 (1908).
- 1464 Townsend, J. A. and Thomas, L. A.: *PCT Int. Appl. WO 94 02,620* (1994); *Chem. Abstr.*, **120**, 210052r (1994).
- 1465 Toyobo Co., Ltd.: *Jpn. Kokai Tokkyo Koho JP 59 11,196 [84 11,196]* (1984); *Chem. Abstr.*, **101**, 3551v (1984).
- 1466 Toyoda, Tatsuo; Sasakura, Kazuyuki and Sugawara, Tsutomu: *J. Org. Chem.*, **46**, 189-191 (1981).
- 1467 Trivedi, P. L. and Sethna, S.: *J. Indian Chem. Soc.*, **28** (5) 245-251 (1951).
- 1468 Tropenwerke Dinklage & Co. (Külz, F. inventor): *Ger. 894,396* (1953); *Chem. Abstr.*, **52**, 14685a (1958).

- 1469 Tsizin, Yu. S.; Shekhtner, O. V.; Sergovskaya, N. L. and Pridantseva, E. A.: U.S.S.R. SU 777,889 (1981); Chem. Abstr., **96**, 138028d (1982).
- 1470 Tsuda, T.: Foods Food Ingredients J. Jpn., **163**, 30-38 (1995); Chem. Abstr., **122**, 212455q (1995).
- 1471 Tsuda, T.; Mizuno, K.; Ohshima, K.; Kawakishi, S. and Osawa, T.: J. Agric. Food Chem., **43** (11) 2803-2806 (1995); Chem. Abstr., **123**, 283998a (1995).
- 1472 Tsuda, T.; Watanabe, M.; Ohshima, K.; Yamamoto, T.; Kawakishi, S. and Osawa, T.: J. Agric. Food Chem., **42** (12) 2671-2674 (1994); Chem. Abstr., **121**, 299533q (1994).
- 1473 Tsuji, N. and Nagashima, K.: Tetrahedron, **25** (15) 3017-3031 (1969).
- 1474 Tsukayama, M.: Bull. Chem. Soc. Jpn., **50** (2) 459-462 (1977).
- 1475 Tung, Chen Ho; Ying, Yun Ming; Yang, Qiang and Wang, Xiao Hong: Chin. Chem. Lett., **6** (1) 27-30 (1995).
- 1476 Tung, Chen-Ho and Xu, Xiao-He: Tetrahedron Lett., **40** (1) 127-130 (1999).
- 1477 Tuor, Urs; Wariishi, Hiroyuki; Schoemaker, Hans E. and Gold, Michael H.: Biochemistry, **31** (21) 4986-4995 (1992).
- 1478 Turan-Zitouni, G.; Demirayak, S. and Chevallet, P.: Acta Pharm. Turc., **34** (1) 23-26 (1992); Chem. Abstr., **117**, 191739q (1992).
- 1479 Turan-Zitouni, G.; Demirayak, S.; Erol, K. and Oezdemir, M.: Farmaco, **49** (11) 755-757 (1994).
- 1480 Turan-Zitouni, G.; Kaplancikli, Z. A. and Chevallet, P.: Farmaco **52** (10) 635-638 (1997); Chem. Abstr., **128**, 204829y (1998).
- 1481 Tutin, F. and Caton, F.: J. Chem. Soc., **97**, 2062-2068 (1910).
- 1482 Tutin, F.: J. Chem. Soc., **97**, 2495-2524 (1910).
- 1483 Tutin, F.; Caton, F. W. and Hann, A. C. O.: J. Chem. Soc., **95**, 2113-2126 (1909).
- 1484 Uenishi, K.; Kawabe, Y. and Kokubo, T.: Eur. Pat. Appl. EP 510,672 (1992); Chem. Abstr., **118**, 180065m (1993).
- 1485 Uenishi, K.; Kawabe, Y. and Kokubo, T.: Jpn. Kokai Tokkyo Koho JP 01,309,052 [89,309,052] (1989); Chem. Abstr., **113**, 68417y (1990).
- 1486 Umeabchi, Y. and Aburano, Y.: Sci. Rep. Kanazawa Univ., **24** (1) 55-60 (1979); Chem. Abstr., **91**, 171935s (1979).
- 1487 Unterhalt, B. and Fahrig, M.: Sci. Pharm., **64** (3/4) 679-686 (1996); Chem. Abstr., **125**, 293442v (1996).
- 1488 Utkin, L. M. and Serebryakova, A. P.: Zh. Obshch. Khim., **34** (10) 3496-3499 (1964).
- 1489 Vaccaro, W.; Amore, C.; Berger, J.; Burrier, R.; Clader, J.; Davis, H.; Domalski, M.; Fevig, T.; Salisbury, B. and Sher, R.: J. Med. Chem., **39** (8) 1704-1719 (1996).
- 1490 Valenti, P.; Belluti, F.; Rampa, A. and Bisi, A.: Synth. Commun., **29** (22) 3895-3899 (1999).
- 1491 Van der Schye, C. J.; Dekker, T. G.; Fourie, T. G. and Snyckers, F. O.: Antimicrob. Agents Chemother., **30** (3) 375-381 (1986); Chem. Abstr., **105**, 226163d (1986).
- 1492 Varache-Beranger, M.; Nuhrich, A. and Devaux, G.: Bull. Soc. Pharm. Bordeaux, **124** (1-2) 85-97 (1985); Chem. Abstr., **104**, 148198g (1986).
- 1493 Varache-Beranger, M.; Nuhrich, A. and Devaux, G.: Farmaco, Ed. Sci., **42** (6) 465-473 (1987).
- 1494 Vargha, L.; Ramonczai, J. and Bathory, J.: J. Am. Chem. Soc., **71**, 2652-2655 (1949).
- 1495 Varma, M.; Varma, R. S. and Parthasarathy, M. R.: J. Prakt. Chem., **325** (3) 382-386 (1983).
- 1496 Vasil'ev, S. A.; Boyarchuk, V. L.; Lukyanchikov, M. S. and Khilya, V. P.: Khim.-Farm. Zh., **25** (11) 50-55 (1991); Chem. Abstr., **116**, 20897q (1992).
- 1497 Vasil'ev, S. A.; Golubushina, G. M.; Kabachnyi, V. I.; Lukyanchikov, M. S.; Molchanov, G. I.; Sokolovskaya, T. I. and Khilya, V. P.: Khim.-Farm. Zh., **24** (9) 38-41 (1990); Chem. Abstr., **114**, 81319h (1991).
- 1498 Vasil'ev, S. A.; Luk'yanchikov, M. S.; Molchanov, G. I.; Turubarov, V. D. and Khilya, V. P.: Khim.-Farm. Zh., **25** (7) 34-38 (1991); Chem. Abstr., **115**, 225849u (1991).
- 1499 Vasil'ev, S. A.; Pivovarenko, V. G. and Khilya, V. P.: Dokl. Akad. Nauk Ukr., Ser. B: Geol., Khim. Biol. Nauki, (4) 34-37 (1989); Chem. Abstr., **112**, 20813b (1989).
- 1500 Vedernikov, D. N.: Khim. Drev., (1) 87-91 (1992); Chem. Abstr., **117**, 133139h (1992).
- 1501 Venkateswarlu, V.: Curr. Sci., **23**, 329-330 (1954); Chem. Abstr., **50**, 3295h (1956).

- 1502 Vercier, P.; Molho, D. and Mentzer, C.: *Bull. Soc. Chim. Fr.*, 1248-1253 (1950).
- 1503 Verma, B. S.; Dhindsa, K. S. and Sangwan, N. K.: *Indian J. Chem., Sect. B*, **32B** (2) 239-243 (1993).
- 1504 Vicari, R.; Kvakovszky, G. and Fruchey, O. S.: U.S. US 5,464,923 (1995); *Chem. Abstr.*, **124**, 57098w (1996).
- 1505 Vicari, R.; Kvakovszky, G.; Fruchey, O. S. and Metz, H. J.: U.S. US 5,464,941 (1995); *Chem. Abstr.*, **124**, 178873d (1996).
- 1506 Vidal-Ollivier, E.; Schwadron, G.; Maillard, C.; Balansard, G. and Ollivier, B.: *J. Chromatogr.*, **396**, 421-424 (1987).
- 1507 Villa, M.-J.; Dominguez, E. and Lete, E.: *Heterocycles*, **24** (7) 1943-1954 (1986).
- 1508 Villanueva-Camanas, R. M.; Sanchis-Mallols, J. M.; Torres-Lapasio, J. R. and Ramis-Ramos, G.: *Analyst (Cambridge, U. K.)*, **120** (6) 1767-1772 (1995).
- 1509 Vitanyi Morvai, M.; Simon, K.; Ritz, I.; Eros Takacsy, T. and Hermecz, I.: *Acta Pharm. Hung.*, **65** (6) 203-207 (1995); *Chem. Abstr.*, **124**, 241883z (1996).
- 1510 Voswinckel, H.: *Ber. Dtsch. Chem. Ges.*, **42**, 4651-4654 (1909).
- 1511 Voznyi, Ya. V.; Dekaprilevich, M. O.; Yufit, D. S. and Struchkov, Yu. T.: *Izv. Akad. Nauk SSSR, Ser. Khim.*, **6**, 1371-1375 (1992); *Chem. Abstr.*, **118**, 124349v (1993).
- 1512 Voznyi, Ya. V.; Yufit, D. S.; Pavlov, V. A. and Struchkov, Yu. T.: *Izv. Akad. Nauk SSSR, Ser. Khim.*, **4**, 913-918 (1983); *Chem. Abstr.*, **111**, 194519e (1989).
- 1513 Wagner, H.; Maurer, I.; Farkas, L. and Strelisky, J.: *Tetrahedron Lett.*, (1) 67-70 (1976).
- 1514 Wagner, H.; Maurer, I.; Farkas, L. and Strelisky, J.: *Tetrahedron*, **33** (11) 1405-1409 (1977).
- 1515 Wagner, H.; Maurer, I.; Farkas, L. and Strelisky, J.: *Tetrahedron*, **33** (11) 1411-1414 (1977).
- 1516 Wähalä, K. and Hase, T. A.: *J. Chem. Soc., Perkin Trans. 1*, (12) 3005-3008 (1991).
- 1517 Wajsman, E.; Grabowski, M. J.; Stepień, A. and Cygler, M.: *Cryst. Struct. Commun.*, **7** (2) 233-236 (1978); *Chem. Abstr.*, **89**, 34629q (1978).
- 1518 Wajsman, E.; Grabowski, M. J.; Stepień, A. and Cygler, M.: *Cryst. Struct. Commun.*, **7** (2) 259-262 (1978); *Chem. Abstr.*, **89**, 51745s (1978).
- 1519 Wallis, A. F. A.; Smith, T. J. and Weame, R. H.: *Int. Symp. Wood. Pulping Chem.*, 8th, **3**, 377-382 (1995); *Chem. Abstr.*, **128**, 49644p (1998).
- 1520 Walz, E.: *Justus Liebigs Ann. Chem.*, **489**, 118-155 (1931).
- 1521 Wang, M. W.; Chen, Y.-J. and Wang, D.: *Synlett*, (3), 385-387 (2000).
- 1522 Wang, M. W.; Chen, Y.-J.; Liu, L.; Wang, D. and Liu, X.-L.: *J. Chem. Res., Synop.*, (2), 80-81 (2000).
- 1523 Watson, P. A.; Wright, L. J. and Fullerton, T. J.: *J. Wood Chem. Technol.*, **13** (3) 391-409 (1993); *Chem. Abstr.*, **119**, 252382h (1993).
- 1524 Weidenhagen, R. and Herrmann, R.: *Ber. Dtsch. Chem. Ges.*, **68**, 1953-1961 (1935).
- 1525 Weisl, S.: *Monatsh. Chem.*, **26**, 977-1002 (1905).
- 1526 Wessely, F. and Lechner, F.: *Monatsh. Chem.*, **57**, 395-404 (1931).
- 1527 Wessely, F.; Kornfeld, L. and Lechner, F.: *Ber. Dtsch. Chem. Ges.*, **66B**, 685-687 (1933).
- 1528 Wessely, F.; Lechner, F. and Dinjaski, K.: *Monatsh. Chem.*, **63**, 201-209 (1933).
- 1529 Wexler, H.; Do Cong Dan and Arventiev, B.: *An. Stiint. Univ. "Al. I. Cuza" Iasi, Sect. Ic*, **19** (2) 153-159 (1973); *Chem. Abstr.*, **80**, 108303s (1974).
- 1530 Whalley, W. B. and Lloyd, G.: *J. Chem. Soc.*, 3213-3224 (1956).
- 1531 Whalley, W. B.: *J. Am. Chem. Soc.*, **75**, 1059-1065 (1953).
- 1532 Whalley, W. B.: *J. Chem. Soc.*, 105-107 (1955).
- 1533 Whalley, W. B.: *J. Chem. Soc.*, 665-671 (1951).
- 1534 Whalley, W. B.: *J. Chem. Soc.*, 1833-1837 (1957).
- 1535 Whalley, W. B.: *J. Chem. Soc.*, 3229-3235 (1951).
- 1536 Whalley, W. B.: *J. Chem. Soc.*, 3366-3371 (1953).
- 1537 Wilds, A. L. and Johnson, T. L.: *J. Am. Chem. Soc.*, **67**, 286-290 (1945).
- 1538 Winterhalder, L. (to Byk-Gulden Lomberg, Chemische Fabrik G.m.b.H.): U.S. 2,838,570 (1958); *Chem. Abstr.*, **52**, 16301a (1958).
- 1539 Winterhalder, L.: U.S. 2,786,671 (1957); *Chem. Abstr.*, **51**, 12975a (1957).
- 1540 Wittig, G. and Schulze, W.: *J. Prakt. Chem.*, **130**, 81-91 (1931).

- 1541 Wittig, G.; Baugert, F. and Richter, H. E.: *Justus Liebigs Ann. Chem.*, **446**, 155-204 (1925).
- 1542 Worden, L. R.; Burgstahler, A. W.; Kaufman, K. D.; Weis, J. A. and Schaaf, T. K.: *J. Heterocycl. Chem.*, **6** (1) 191-198 (1969).
- 1543 Wu, E. S. C.; Cole, T. E.; Davidson, T. A.; Blosser, J. C.; Borrelli, A. R.; Kinsolving, C. R.; Milgate, T. E. and Parker, R. B.: *J. Med. Chem.*, **30** (5) 788-792 (1987).
- 1544 Xie, M.; Zhang, Y.; Wang, A. and Wong, W.: *Beijing Shifan Daxue Xuebao, Ziran Kexueban*, **31** (4) 487-490 (1995); *Chem. Abstr.*, **125**, 86550p (1996).
- 1545 Yamaguchi, T.; Hayashi, H.; Yoshida, R. and Nomura, T.: *Jpn. Kokai Tokkyo Koho* 07 17,856 [95 17,856] (1995); *Chem. Abstr.*, **122**, 205206f (1995).
- 1546 Yamahara, J.; Torihara, M. and Tamai, H.: *Jpn. Kokai Tokkyo Koho JP* 04,356,479 [92,356,479] (1992); *Chem. Abstr.*, **118**, 183429u (1993).
- 1547 Yamaki, M.; Miwa, M.; Ishiguro, K. and Takagi, S.: *Phytother. Res.*, **8** (2) 112-114 (1994); *Chem. Abstr.*, **121**, 153116j (1994).
- 1548 Yamamoto, A.; Ashina, T.; Oosawa, T. and Tsuda, T.: *Jpn. Kokai Tokkyo Koho JP* 07,268,322 [95,268,322] (1995); *Chem. Abstr.*, **124**, 54238f (1996).
- 1549 Yamamoto, H.; Johnson, R. and Funato, S.: *Ger. Offen. DE* 4,337,692 (1994); *Chem. Abstr.*, **121**, 217170g (1994).
- 1550 Yamamoto, J.; Asano, M.; Okamoto, Y. and Sugita, K.: *Chem. Express*, **4** (1) 37-40 (1989).
- 1551 Yamamoto, J.; Kashiwara, N.; Fujii, Y.; Takahara, K. and Hashimoto, K.: *Nippon Kagaku Kaishi*, **2**, 134-138 (1991); *Chem. Abstr.*, **114**, 228182u (1991).
- 1552 Yamamoto, J.; Kisida, M.; Takenaka, Y. and Okamoto, Y.: *Nippon Kagaku Kaishi*, **3**, 288-293 (1988); *Chem. Abstr.*, **110**, 134837b (1989).
- 1553 Yamamoto, J.; Kurokawa, H. and Sugita, K.: *Nippon Kagaku Kaishi*, **11**, 2107-2110 (1985); *Chem. Abstr.*, **105**, 152640h (1986).
- 1554 Yamamoto, J.; Nakane, I.; Nakashima, M.; Asano, M.; Akamatsu, H.; Okamoto, Y. and Sugita, K.: *Nippon Kagaku Kaishi*, **9**, 1587-1592 (1989).
- 1555 Yamamoto, K. and Tsujii, H.: *J. Pharm. Soc. Jpn.*, **75**, 1226-1228 (1955); *Chem. Abstr.*, **50**, 8598c (1956).
- 1556 Yamashita, M.: *Science Repts. Tôhoku Imp. Univ.*, 1st Ser. **18**, 615-618 (1929); *Chem. Abstr.*, **24**, 2443 (1930).
- 1557 Yamato, M.; Hashigaki, K.; Uenishi, J.; Yamakawa, I.; Sato, N. and Koyama, T.: *Chem. Pharm. Bull.*, **23** (12) 3101-3105 (1975).
- 1558 Yamato, Masatoshi: *Jpn. Kokai Tokkyo Koho JP* 01,258,668 [89,258,668] (1989); *Chem. Abstr.*, **112**, 178482c (1990).
- 1559 Yanagisawa, T.; Sato, S.; Maruno, M. and Nomura, T.: *Jpn. Kokai Tokkyo Koho JP* 07 17,858 [95 17,858] (1995); *Chem. Abstr.*, **122**, 205224k (1995).
- 1560 Yang, Y.; Wang, M. and Wang, D.: *Chem. Commun. (Cambridge)*, (17), 1651-1652 (1997).
- 1561 Yao, Run-hua; Ma, Rong-Sheng; Chen, Yao-Qing and Huang, Lan-Sun: *Yaoxue Xuebao*, **19** (3) 228-231 (1984); *Chem. Abstr.*, **103**, 123103p (1985).
- 1562 Yasufuku, S. and Motonaga, A.: *PCT Int. Appl. WO* 93 19,066 (1993); *Chem. Abstr.*, **120**, 164170c (1994).
- 1563 Yeo, Hosup and Kim, Jinwoong: *Phytochemistry*, **46** (6) 1103-1105 (1997).
- 1564 Yoder, L.; Edmund, W.; Cheng, K. and Burroughs, W.: *Proc. Iowa Acad. Sci.*, **61**, 271-277 (1954); *Chem. Abstr.*, **49**, 13236f (1955).
- 1565 Yue, Baozhen; Zhou, Zewei and Cai, Mengshen: *Gaodeng Xuexiao Huaxue Xuebao*, **11** (1) 99-101 (1990); *Chem. Abstr.*, **113**, 78089g (1990).
- 1566 Zaher, H. A.; Abdel-Rahman, R. M. and Abdel-Halim, A. M.: *Indian J. Chem., Sect. B*, **26B** (2) 110-115 (1987).
- 1567 Zanina, A. S.; Al't, L. Ya.; Shergina, S. I. and Kotlyaresvskii, I. L.: *Izv. Akad. Nauk SSSR, Ser. Khim.*, (2) 459-461 (1970); *Chem. Abstr.*, **73**, 3619b (1970).
- 1568 Zanina, A. S.; Cherepov, E. I.; Golubev, V. S.; Sokolov, I. E. and Kotlyarevskii, I. L.: *U.S.S.R.* 203,904 (1967); *Chem. Abstr.*, **69**, 19812n (1968).
- 1569 Zbiral, E.; Saiko, O. and Wessely, F.: *Monatsh. Chem.*, **95**, 512-532 (1964).
- 1570 Zdero, C.; Bohlmann, F. and Niemeyer, H. M.: *Phytochemistry*, **29** (10) 3247-3253 (1990).

- 1571 Zemplen, G.; Bogнар, R. and Farkas, L.: Ber. Dtsch. Chem. Ges., **76B**, 267-272 (1943).
- 1572 Zemplen, G., Farkas, L. and Sattler, T.: Acta Chim. Acad. Sci. Hung., **22** (4) 449-454 (1960).
- 1573 Zemplen, G.; Farkas, L. and Schuller, N.: Acta Chim. Acad. Sci. Hung., **19**, 277-283 (1959).
- 1574 Zemplen, G.; Mester, L. and Pallos, L.: Acta Chim. Acad. Sci. Hung., **8**, 133-138 (1956).
- 1575 Zeng, L.; Fukui, T.; Nomura, T.; Zhang, R. Y. and Lou, Z. C.: J. Chem. Soc., Perkin Trans. 1, (10), 1153-1159 (1993).
- 1576 Zhang, Dechun; Zhang, Yanqiu and Lu, Chengrong: Wuli Huaxue Xuebao, **14** (1) 63-67 (1998); Chem. Abstr., **128**, 243703x (1998).
- 1577 Zhang, K.; Corrie, J. E. T.; Munasinghe, R. N. and Wan, P.: J. Am. Chem. Soc., **121**, 5625-5632 (1999).
- 1578 Zhou, Demin; Li, Ruzhang; Yue, Baozhen and Cai, Monshen: Huaxue Tongbao, (5) 42-43 (1997); Chem. Abstr., **127**, 81205m (1997).
- 1579 Zilberman, E. N. and Rybakova, N. A.: Zh. Obshch. Khim., **32** (2) 591-596 (1962).
- 1580 Zilliken, F. W.: PCT Int. Appl. 80 02,098 (1980); Chem. Abstr., **95**, 41045y (1981).
- 1581 Zilliken, F. W.: U.S. 4,264,509 (1981); Chem. Abstr., **95**, 113769n (1981).
- 1582 Zincke, T.: Justus Liebigs Ann. Chem., **325**, 19-92 (1902).

## MOLECULAR FORMULA INDEX

### **C<sub>8</sub>H<sub>3</sub>Br<sub>2</sub>F<sub>3</sub>O<sub>3</sub>**

1-(3,5-Dibromo-2,4-dihydroxyphenyl)-2,2,2-trifluoroethanone, 71

### **C<sub>8</sub>H<sub>3</sub>Br<sub>5</sub>O<sub>2</sub>**

2,2,2-Tribromo-1-(3,5-dibromo-2-hydroxyphenyl)ethanone, 31

### **C<sub>8</sub>H<sub>3</sub>Cl<sub>2</sub>F<sub>3</sub>O<sub>3</sub>**

1-(3,5-Dichloro-2,4-dihydroxyphenyl)-2,2,2-trifluoroethanone, 71

### **C<sub>8</sub>H<sub>3</sub>F<sub>3</sub>N<sub>2</sub>O<sub>7</sub>**

1-(2,4-Dihydroxy-3,5-dinitrophenyl)-2,2,2-trifluoroethanone, 71

### **C<sub>8</sub>H<sub>4</sub>BrF<sub>3</sub>O<sub>2</sub>**

1-(3-Bromo-4-hydroxyphenyl)-2,2,2-trifluoroethanone, 71

### **C<sub>8</sub>H<sub>4</sub>BrF<sub>3</sub>O<sub>3</sub>**

1-(5-Bromo-2,4-dihydroxyphenyl)-2,2,2-trifluoroethanone, 72

### **C<sub>8</sub>H<sub>4</sub>Br<sub>2</sub>I<sub>2</sub>O<sub>2</sub>**

2,2-Dibromo-1-(4-hydroxy-3,5-diiodophenyl)ethanone, 27

### **C<sub>8</sub>H<sub>4</sub>Br<sub>2</sub>N<sub>2</sub>O<sub>6</sub>**

2,2-Dibromo-1-(4-hydroxy-3,5-dinitrophenyl)ethanone, 27

### **C<sub>8</sub>H<sub>4</sub>Br<sub>3</sub>NO<sub>4</sub>**

2,2-Dibromo-1-(3-bromo-4-hydroxy-5-nitrophenyl)ethanone, 27

### **C<sub>8</sub>H<sub>4</sub>Br<sub>4</sub>O<sub>2</sub>**

2,2-Dibromo-1-(3,5-dibromo-2-hydroxyphenyl)ethanone, 27

2,2-Dibromo-1-(3,5-dibromo-4-hydroxyphenyl)ethanone, 28

### **C<sub>8</sub>H<sub>4</sub>Br<sub>4</sub>O<sub>3</sub>**

2,2-Dibromo-1-(3,5-dibromo-2,4-dihydroxyphenyl)ethanone, 28

### **C<sub>8</sub>H<sub>4</sub>ClF<sub>3</sub>O<sub>3</sub>**

1-(3-Chloro-2,4-dihydroxyphenyl)-2,2,2-trifluoroethanone, 72

1-(5-Chloro-2,4-dihydroxyphenyl)-2,2,2-trifluoroethanone, 72