

*Part 1:*  
*Lehmann's Phosphor Cookbook*  
*and Phosphor Tables*

## *Section 1: Introduction*

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### INTRODUCTION

The following is Willi Lehmann's introduction to his *Phosphor Cookbook*:

The writer of this report has, during about 25 years of practical experience, prepared and tested roughly  $2 \times 10^4$  individual samples of inorganic phosphors of various kinds. It is unavoidable in such work that many samples perform too poorly to be worth mentioning. Many others were just repetitions during optimizations, etc. of the same materials. What remains are relatively few. This report describes some 200 phosphors which are commercially in use already, which appear to have some potential to become commercially useful, or which are otherwise somehow “interesting” (to the writer, at least). Most of them are well known (more or less), but some are new and have never been mentioned anywhere else. The following tables give, for each phosphor, a brief description of how to prepare it and an equally brief description of its main properties. References to open publications or internal reports, where available, are added to help anyone wishing to know more about a particular material than these tables can give.

The phosphor collection covered by this “cookbook” is not complete, of course. It will never be. It may anyway serve as a convenient guide for all occasional or professional users of phosphorus showing essentially what is available. Each one of the recipes is only a suggestion. It has been tried in this laboratory and it works, but it does not mean that a variation of the recipe does not work. In fact, the writer believes that most of the recipes still permit substantial improvements. It may remain to the individual phosphor chemist to work out such improvements.

The professional phosphor chemist has often, only half jokingly, been referred to as “phosphor cook.” Peculiarly, and despite of the fact that so many different phosphors are now available, there has been no phosphor cookbook before. To fill out this gap is the purpose of this report.

In the abstract to the report Lehmann expected that the cookbook would be useful as:

1. a survey of materials for which properties are available to the occasional user of phosphors,
2. a guide to help anyone new in the field in the successful preparation of phosphors,
3. a start for the experienced phosphor chemist in the improvement of known materials or in the development of new ones.

Most of the following two sections (with the exceptions of Sections 2.2 and 2.3) are predominantly taken verbatim from Lehmann's report.