

Chapter 10

REFRACTIVE INDEX, DIPOLE MOMENT AND RADIUS OF GYRATION

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ABSTRACT

Results for refractive index, dipole moment and radius of gyration are presented for major organic and inorganic chemicals. The chemical formula and molecular weight are also given. The results are displayed in easy-to-use tabulations which are especially applicable for rapid engineering usage with the personal computer or hand calculator. The organic chemicals encompass hydrocarbon, oxygen, nitrogen, halogen, silicon, sulfur and other compound types.

INTRODUCTION

Physical properties such as refractive index, dipole moment and radius of gyration are of special value to engineers in the chemical processing and petroleum refining industries. Since these properties are used in thermodynamic correlations that are involved in the design of process equipment, the results of this article are intended for initial engineering studies.

REFRACTIVE INDEX, DIPOLE MOMENT AND RADIUS OF GYRATION

The refractive index is an indication of the manner in which a compound interacts with light. The refractive index is defined as the ratio of the speed of light in a vacuum to the speed of light in the compound. Most of the values for index of refraction are applicable to a temperature of 25 C. Exceptions to this temperature are noted in the tabulations.

The dipole moment involves the first moment of the electric charge density of the compound. Property correlations for polar compounds often require knowledge of the dipole moment. The radius of gyration is ascertained from the moment of inertia and molecular weight. This property is also used in thermodynamic correlations.

The results for refractive index, dipole moment and radius of gyration are given in Tables 10-1 and 10-2 for organic and inorganic compounds. The tabulations are based on data source publications for organics (1-59) and inorganics (1-48). The tabulations are arranged by chemical formula to provide ease of use in quickly locating data.

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