



## Study of Some Volumetric Properties of the Pharmaceutical Model Solvent System Ethanol + Ethyl Acetate at Several Temperatures

Miller A. RUIDIAZ <sup>1</sup>, Edgar F. VARGAS <sup>2</sup> & Fleming MARTÍNEZ <sup>1\*</sup>

<sup>1</sup> *Grupo de Investigaciones Farmacéutico-Fisicoquímicas, Departamento de Farmacia, Facultad de Ciencias, Universidad Nacional de Colombia, A.A. 14490, Bogotá D.C., Colombia.*

<sup>2</sup> *Laboratorio de Termodinámica de Soluciones, Departamento de Química, Facultad de Ciencias, Universidad de los Andes, Bogotá D.C., Colombia.*

**SUMMARY.** The binary solvent system ethanol + ethyl acetate is widely used in the pharmaceutical sciences as a versatile model for studying the solubility of drugs. In this context, the excess molar volumes and the partial molar volumes of components were investigated from density measurements on the entire range of mass fractions, for this system at 293.15 K, 298.15 K, 303.15 K, 308.15 K, and 313.15 K. The excess molar volumes were fitted by Redlich-Kister equation by using third degree polynomials and compared with those reported in the literature for other solvent systems. The system tested exhibited positive excess volumes (up to 0.18 cm<sup>3</sup> mol<sup>-1</sup> at 313.15 K), probably due to weak interactions, like dispersion forces, between unlike molecules or, some differences in the molar volumes of pure components. The effect of temperature on the different volumetric properties studied was also analyzed.

**KEY WORDS:** Binary liquid mixtures, Ethanol, Ethyl acetate, Excess volumes, Partial volumes.

\* Author to whom correspondence should be addressed. *E-mail:* fmartinezr@unal.edu.co