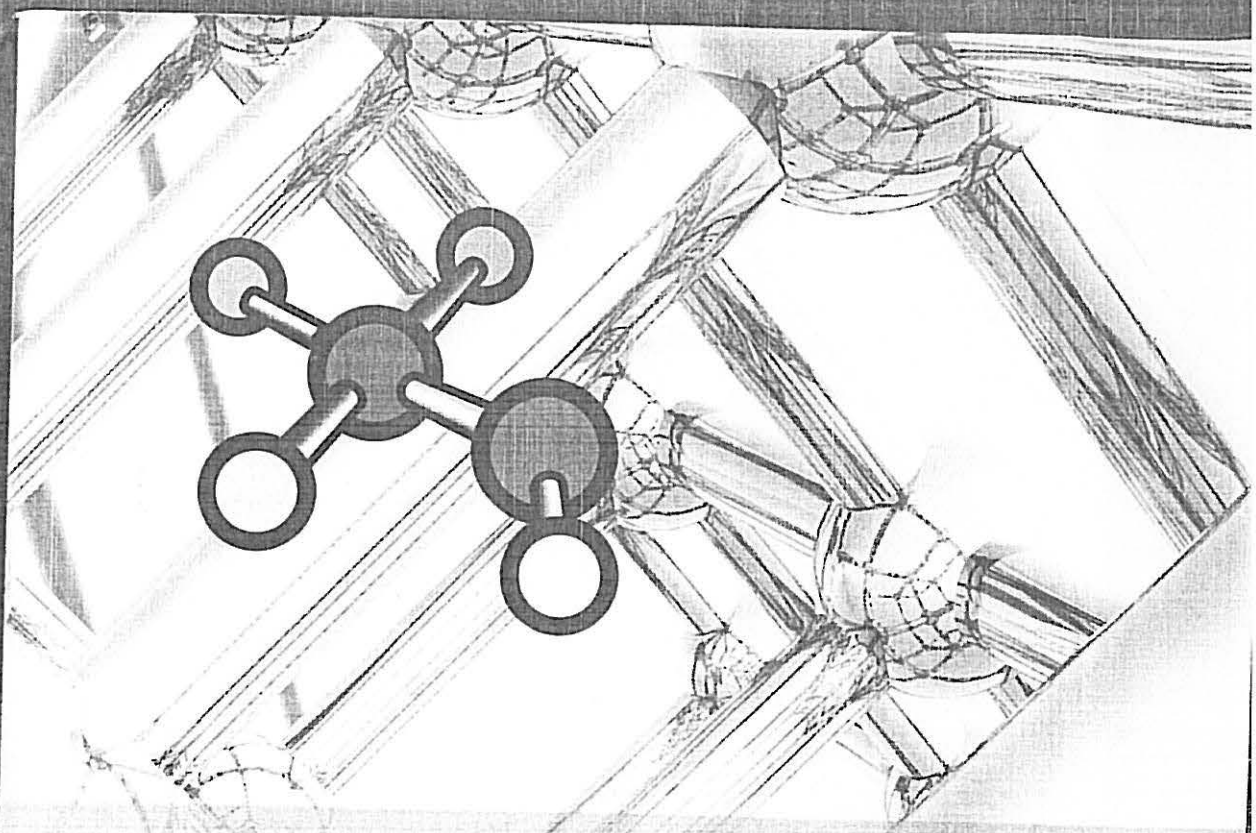

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SOLID-LIQUID EQUILIBRIA OF SOME PHARMACEUTICAL COMPOUNDS

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Solubility is an important property which affects the release, transport and absorption of drugs. Solubility data involving new drug molecules and their precursors are frequently unavailable hampering drug formulation. Although some thermodynamic models can be used, the existence of some experimental data is still fundamental for an appropriate model development and evaluation.

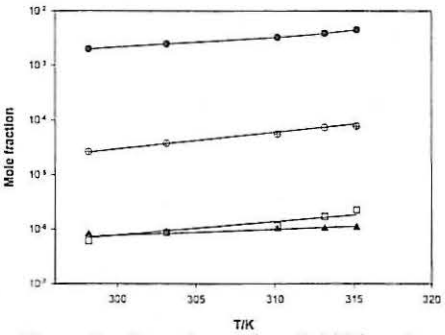

Figure 1. Experimental solubilities (●, paracetamol; ▲, budesonide; □, furosemide; ⊕, allopurinol) in water and modeling results (—).

In this work, solubilities of some drugs, such as paracetamol, budesonide, allopurinol and furosemide were measured as a function of the temperature in several solvents, namely water, ethanol and acetone. Solubilities were determined by the analytical shake-flask method, using constant temperature jacketed glass cells for generating the saturated solutions, followed by composition analysis by HPLC. As the analytical shake-flask method is an expensive and time consuming procedure, an alternative method to measure solubility using DSC was also studied [1], with the advantage of being faster and consuming smaller amounts of sample. Melting data of the pure drugs were also obtained by DSC.

The NRTL-SAC model [2] was used to represent the measured data. This model provides a simple and practical thermodynamic framework for phase equilibria of drug systems. A comparison between experimental and model results showed that NRTL-SAC is an appropriate tool to represent the solubility of these complex molecules.

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[1] R. Mohan, H. Lorenz, A.S. Myerson, *Ind. Eng. Chem. Res.* 41 (2002) 4854.
[2] C.C. Chen, Y.H. Song, *Ind. Eng. Chem. Res.* 43 (2004) 8354.