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Evaluation of solid-liquid equilibria for drug + water + cyclodextrin derivatives systems using activity coefficient model

Authors and affiliation

Hiroyuki Matsuda[1], Kiyofumi Kurihara[1], and Katsumi Tochigi*[,1]

[1] Department of Materials and Applied Chemistry, Nihon University, 1-8-14 Kanda Surugadai, Chiyoda-ku, Tokyo 101-8308, Japan

*E-mail: tochigi.katsumi@nihon-u.ac.jp

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Abstract (less than 300 words)

Drug candidates with strong pharmacological activity have increasingly been developed using combinatorial chemistry and high-throughput screening. As a result of these screening methods, the number of drugs with decreased water solubilities has increased due to higher molecular weights and more complicated chemical structures. Therefore, the co-solvents are commonly used in the pharmaceutical industry in order to increase the solubility of relatively water insoluble drugs. The solid-liquid equilibria for systems containing drugs and co-solvents have been measured [1, 2].

Some predictive method in order to predict the solubility of drugs using activity coefficient models have been proposed [3]. But the co-solvents are liquids. Recently we have the interests to cyclodextrins as co-solvents.

This paper deals with evaluation of solubility for drug + water + solid co-solvent system using activity coefficient models. The drugs treated in this paper are etodolac, famotidine, naringin, and the co-solvents are cyclodextrin derivatives (α-CD, β-CD, 2-HP-β-CD, 2-HE-β-CD, M-β-CD, DM-β-CD, SBE-β-CD). The activity coefficient models used in this study are Wilson and Wilson + Porter equations.

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