Inclusion Complex of Pipemidic acid with beta-Cyclodextrin: physicochemical characterization in solid and solution state.

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Pipemidic acid, 8-ethyl-5,8-dihydro-5-oxo-2-(1-piperazinyl)-pyrido [2,3-d]pyrimidine-6-carboxylic acid (PIPE), is a yellowish-white powder with a bitter taste. PIPE is a therapeutic agent for urinary tract infections: it is active against gram-negative bacteria including P. aeruginosa, E. coli, etc.; as well as some gram-positive bacteria. This drug is slightly soluble in water, but soluble in acid and alkaline solutions. In order to increase the aqueous solubility of PIPE, we have employed β-cyclodextrin (beta-CD) to form non covalent complex. An inclusion complex of PIPE with beta-CD [1] was prepared in the solid state by kneading method and physical mixture. The formation of the inclusion complex was confirmed by Fourier Transform-Infrared spectroscopy [2]. In aqueous solution, the effect of beta-CD on the absorption spectra of PIPE has been studied in buffer solutions at different pH (4.6, 6.8, 8.6). The 1:1 stoichiometry was established by a Job plot [3]. The inclusion complex formation was investigated by UV-Vis titration and the stability constant (Kb) of the complex was determined. The phase solubility studies, according to Higuchi and Connors method [4], were also performed at different pH values.