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The Adsorption of Ketotifen and Allopurinol by Chitosan,

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Abstract: It was of interest to study the adsorption of ketotifen and allopurinol by chitosan. The experimental work focused on determination of the solubilities and the adsorption isotherms of the adsorbates employed in this study. The adsorption of the aforementioned compounds by chitosan was studied using the rotating bottle method. The concentrations, both before and after the attainment of equilibrium were determined with the aid of a reversed-phase HPLC column. The results of these studies demonstrated that ketotifen and allopurinol are both adsorbed by chitosan. The nonlinear Langmuir-like model and Freundlich model were both applied to the experimental data. The correlation coefficients obtained from the nonlinear Langmuir-like model were better than those obtained from Freundlich model. This result suggests that allopurinol and ketotifen interact with certain specific binding sites on the chitosan surface. However, selection of the most appropriate model must await further studies on heats of adsorption. The results from the allopurinol adsorption experiments indicated that the particle size of chitosan and therefore the surface area can significantly affect the Langmuir capacity constant, while the affinity constants are statistically the same. The results from the ketotifen adsorption experiments at two different pHs (7 and 10) showed that the adsorption affinity at pH 10 is much higher than at pH 7. This was expected based on the solubility studies. The capacity constants were significantly different. This result was not expected and further studies are needed using common ion buffers and multicomponent adsorption in order for the proper mechanism to be determined.