Adsorption and Desorption of Phenylalanine and Tryptophane on a Nonionic Polymeric Sorbent

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Amino acids have been wildely used in many fields such as food, chemical, pharmaceutical, medicine cosmetic industries. In this study, adsorption equilibrium of two amino acids (Phenylalanine (Phe) and Tryptophane (Trp)) in terms of pH and temperature was studied using a nonionic polymeric sorbent (SP850). Adsorption equilibrium data of two amino acids on SP850 were fitted well with the Langmuir and Freundlich equations. Thermodynamic parameters such as Gibbs free energy, enthalpy, and entropy were evaluated by applying Van't Hoff equation. Adsorption kinetic data were analyzed using the models of pseudo-first-order, pseudo-second-order and intraparticle diffusion. The results indicated that the pseudo-second-order model was more successful in simulating the adsorption kinetic data and the adsorption rate was mainly controlled by the diffusion rate in adsorption process. On the other hand, desorption studies were conducted by employing different organic solvents such as isopropyl alcohol (IPA), ethanol, methanol. It was found that IPA was the best material for desorbing amino acid on polymeric sorbent.