

Liquid Phase adsorption of alpha-Tocopherol by activated carbon

Abstract

α -Tocopherol or commonly called vitamin E can be found in major commercial vegetable oils such as soya oil and palm oil. However the existence in these oil is in low concentration. The recovery of low concentration of α -tocopherol from palm oils is increasingly popular. Adsorption technique for the recovery of α -tocopherol from palm oil is believed to be much lower in cost and more effective. As a case study in this work, activated carbon is chosen as the adsorbent and ethanol as the solvent. The adsorption equilibria of α -tocopherol onto activated carbon was conducted in batch and the concentration of α -tocopherol was identified by LCMS. Langmuirian monolayer adsorption theory was used for the analysis of the isotherm equilibria. The adsorptivity of α -tocopherol onto activated carbon was identified. The adsorption equilibria at low concentration found to be linear. The breakthrough curve was then generated using model assuming isothermal, single transition trace component with intraparticle diffusion. Sensitivity test on the curve indicated that the system is very sensitive to changes in diffusivity and passive to changes on the equilibrium constant.