

The Use of Diagnostic Plots and Interaction Plots for Describing the Effect of Factors Affecting Vanillin Adsorption onto Resin H103

Rozaimi Abu Samah^{1,2}, Norazwina Zainol², Phang Lai Yee¹, Suraini Abd-Aziz^{1,*}

(1) Department of Bioprocess Technology, Faculty of Biotechnology & Biomolecule Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

(2) Faculty of Chemical Engineering & Natural Resources, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, Malaysia.

Telephone no.: +603-89471050

Facsimile no.: +60389467590

* Author to whom all correspondence should addressed. E-mail: suraini@upm.edu.my

Abstract

Fractional factorial screening methodology was used in order to explain the effect of several factors - contact time, initial vanillin concentration, resin dosage, pH and temperature - affecting the adsorption of vanillin onto resin H103 in batch mode. With the aid of Design Expert, 2^5 fractional factorial screening was utilized. Statistical analysis showed that initial vanillin concentration and resin dosage were significant. The analysis of variance (ANOVA) gave a very good determination coefficient (R^2) of 0.9996. Diagnostic plots, such as normal probability plot, residuals versus predicted values plot, and outlier T plot; and factors interaction plots, were used to further validate the model obtained and to explain the effects of the parameters involved in the adsorption of vanillin onto resin H103.

Keywords

Vanillin, adsorption, experimental design, factorial screening