

## Separation of Oryzanol from Rice Bran Oil Using Silica: Equilibrium of Batch Adsorption

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**Abstract :** Rice bran oil contains significant amounts of oryzanol, a natural antioxidant that considered has higher antioxidant activity than vitamin E (tocopherol). Oryzanol reviewed has several health properties and interested in pharmacy, nutrition, and cosmetics. For practical usage, isolation and purification would be necessary due to the low concentration of oryzanol in crude rice bran oil (0.9-2.9%). Batch chromatography has proved as a promising process for the oryzanol recovery, but productivity was still low and scale-up processes of industrial interest have not yet been described. In order to improve productivity of batch chromatography, a continuous chromatography design namely Simulated Moving Bed (SMB) concept have been proposed. The SMB concept has interested for continuous commercial scale separation of binary system (oryzanol and rice bran oil), and rice bran oil still obtained as side product. Design of SMB chromatography for oryzanol separation requires quantification of its equilibrium. In this study, equilibrium of oryzanol separation conducted in batch adsorption using silica as the adsorbent and n-hexane/acetone (9:1) as the eluent. Three isotherm models, namely the Henry, Langmuir, and Freundlich equations, have been applied and modified for the experimental data to establish appropriate correlation for each sample. It turned out that the model quantitatively describe the equilibrium experimental data and will directed for design of SMB chromatography.

**Keywords :** adsorption, equilibrium, oryzanol, rice bran oil, simulated moving bed

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