

Experimental Design and Optimization of Diesel Oil Desulfurization Process by Adsorption Processes

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Abstract : Thiophene sulfur compounds' removal from diesel oil by batch adsorption process using commercial powdered activated carbon was designed and optimized in two-level factorial design method. This design analysis was used to find out the effects of operating parameters directing the adsorption process, such as amount of adsorbent, temperature and stirring time. The desulfurization efficiency was considered the response or output variable. Results showed that the stirring time had the largest effects on sulfur removal efficiency as compared with other operating parameters and their interactions under the experimental ranges studied. A regression model was generated to observe the closeness between predicted and experimental values. The three-dimensional plots and contour plots of main factors were generated according to the regression results to observe the optimal points.

Keywords : activated carbon, adsorptive desulfurization, factorial design, process optimization

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