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Evaluation study of different types adsorbents in minimizing sulfur contents in diesel fuel

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Three types of adsorbents: Bentonite clay, silica gels, charcoal were selected to evaluate their behavior in minimizing sulfur contents in diesel fuel, and to characterize the more efficient adsorbent. Native diesel fuel with sulfur contents of 0.8% was received in a temperature range between (250–320°C) from fractional distillation of crude oil obtained from field of Kirkuk/Iraq with sulfur contents of 2% was used in this work. Desulfurization was performed in a continuous circulation of 150 ml of diesel fuel through a glass column (2 cm id×25 cm length) containing 100 g adsorbent by circulating pump. Adsorption for sulphur contents was investigated at different duration of times: 2, 4 and 6 h. Bentonite exhibited the maximum desulphurization yield of 65% at 6 h adsorption. Surface areas of all adsorbents were characterized by SEM and EDX analysis. The FT-IR study of the desulphurized diesel sample revealed that mostly high molecular weight thioles and thiophenic compounds were depleted during adsorption process.

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