

STUDY OF CATALYTIC HYDROGENATION OF DIESEL DISTILLATE FROM SHALE OILS

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The properties and compositions of the two diesel distillates from Fushun and Huadian shale oils were investigated and compared for the first time in this paper. Catalytic hydro-treating of two diesel distillates was carried out in a fixed-bed reactor using sulfided $\text{Co-Mo/Al}_2\text{O}_3$, $\text{NiW/Al}_2\text{O}_3$, and $\text{NiMoW/Al}_2\text{O}_3$ catalysts. The effects of several factors on the product properties were studied. Furthermore, the lumping kinetic models of HDS and HDN reactions were established and calculated. The results showed that shale oils contained a considerable amount of heteroatomic compounds and unsaturated hydrocarbons. The catalyst $\text{NiMoW/Al}_2\text{O}_3$ showed the most activity for removal of sulfur and nitrogen. Under the optimum conditions, produced diesels could be directly used as clean diesel fuels. The three-lumping kinetic model fits for the HDS reaction and the four-lumping kinetic model can be reasonably used to describe the HDN reaction.