

Selective Removal of Sulfur Compounds form Commercial Diesel using Nickel Impregnated SBA-15 as Adsorbent

박정근, 고창현, 한상섭, 조순행, 김종남*
한국에너지기술연구원
(jnkim@kier.re.kr*)

The sulfur compounds in transportation fuels is highly undesirable due to its harmful effect on catalytic converter and environment. Hydrodesulfurization (HDS) has been used to remove the sulfur compounds in transportation fuels for over 50 years. Recently, new restriction, which regulated sulfur concentration in transportation fuels less than 10 ppm, is expected to be set from 2010. Under this regulation, conventional HDS needs 3 times larger reactor and higher reaction temperature. Thus, alternatives for the production of low sulfur contents in transportation fuels are attractive. In this study, we investigated desulfurization of diesel by reactive adsorption method. Nickel impregnated SBA-15 (Ni/SBA-15) was used as an adsorbent. Sulfur adsorption capacity for Ni/SBA-15 was measured by breakthrough tests using commercial diesel with 240 ppmw S. Adsorption capacity highly depends on the adsorption temperature. Increase of adsorption temperature from room temperature to 200 °C raised the breakthrough adsorption capacity of Ni/SBA-15. Optimum Nickel loading, reduction temperature, and impregnation method were also investigated to maximize sulfur adsorption capacity.