Determination of Optimal Conditions for Hydrogenolysis of Sulfur Compounds to Improve Efficiency of Jet Fuel Production

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Nowadays, the air transportation market and air transport infrastructure are experiencing another cycle of transformations and modernizations. The global trend in air travel is aimed at subsidizing of production of new airports and purchase of aircrafts in order to increase passenger traffic. Thereby, increase in jet fuel output using the most efficient production technologies is becoming significant everywhere. Our research work is devoted to organic chemistry and oil processing industry. During the study period, selection of the most efficient production technology for production of jet fuel that meets international standards has been confirmed. Laboratory tests have been run in order to determine optimal parameters of purification process of straight-run jet fuel. Straight-run kerosene contains sulfur compounds such as mercaptans, sulfides, disulfides, etc. It is advisable to remove only mercaptans and leave other sulfur compounds to preserve lubricity of kerosene. The existing unit does not meet the experiment requirements. We have modernized it in order to run our experiment. Laboratory tests have been run. We have performed jet fuel purification process at a temperature from 190 to 260degrees Celsius and at a hydrogen pressure from 6 to 15 bar. The results of the experiment have shown optimal temperature and pressure parameters (200 degrees Celsius and 6 bar units). Also, in temperature from 200 to 250 degrees Celsius and pressure from 6 to 10 bar units only mercaptans react with hydrogen. The results of our research have been used on the hydrodemercaptanization unit at the oil refinery in our city to reduce manufacturing costs. This method is the most economically attractive in comparison with widely used caustic demercaptanization and hydrotreating processes.

Awards Won:
Third Award of $1,000