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N-HEXADECANE HYDROISOMERIZATION IN THE PRESENCE OF AL-HMS - BASED BIFUNCTIONAL CATALYST

Abstract. In this article the synthesis of a nickel-promoted composite based on a mesoporous aluminosilicate of the Al-HMS type and activated bentonite from the Tagan deposit is provided. The physical and chemical characteristics of the Ni/Al-HMS-bentonite composite and the action of temperature on the group hydrocarbon-type content of the normal hexadecane hydroisomerization products in the presence of a synthesized aluminosilicate - based composite were studied. Adsorption studies show that the synthesized catalyst Ni/Al-HMS-bentonite with a silicon-to-aluminium ratio (Si/Al) = 20 is characterized by a higher specific surface area (570 m²/g). It has been established that 300 °C is the optimum temperature for carrying out the process of hydroisomerization of normal hexadecane. Under these conditions the main direction of its transformation is the isomerization process. The total yield of isoparaffins was 45%.

Key words: Mesoporous aluminosilicate, hydroisomerization, dewaxing, diesel fuel oil, higher n-paraffins, template.

The process of hydroisomerization of oils' diesel fractions on aluminosilicate catalysts is the most promising low-tonnage production of low pour point diesel fractions.

Diesel fractions obtained during the primary oil refining usually contain a significant amount of normal paraffins and therefore are characterized by high temperature properties and are unsuitable for use as fuel during the winter period in cold regions without additional refining.

One of the most promising ways to improve the performance of diesel fractions is the process of catalytic dewaxing of diesel fractions. The process of catalytic dewaxing is based on the selective hydrocracking and hydroisomerization of higher n-paraffins of the diesel fraction on bifunctional catalysts [1-9]. The main feature of bifunctional catalysts is the ability of their active centers to accelerate reactions proceeding via different mechanisms. Most often, bifunctional catalysts are used, in which simultaneously exist: acidic active sites, which accelerate the reactions of breaking and isomerization of the hydrocarbon chain, and sites which are active in hydrogenation and dehydrogenation reactions. The selectivity of bifunctional catalysts depends on the ratio of their acidic and hydrodehydrogenating functions. Mesoporous aluminosilicates with a specific surface area of more than 500 m²/g are most often used as the acid base of catalysts. Acidic activity is determined by the structural type of aluminosilicate and the composition of its active centers, which, in turn, depends on the chemical compo-