Hydrogenation of Polyaromatic Compounds Over NiCo/chrysotile Catalyst

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Research

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Abstract

The activity and selectivity of the NiCo/chrysotile catalyst during the hydrogenation of model objects (anthracene and phenanthrene) for 1 hour at an initial hydrogen pressure of 3 MPa and a temperature of 400 °C were studied. The catalyst is characterized by a complex of methods of physical and chemical analysis. The chrysotile mineral used as a substrate consists of nanotubes with an inner diameter of about 10 nm and an outer diameter of about 60 nm. When a catalyst is prepared by wet mixing, chrysotile nanotubes can be filled with nickel and cobalt ions from solutions of the corresponding salts. The selectivity of the catalyst in hydrogenation was shown. The yields of the products of hydrogenation and degradation of anthracene are 62% and 15%, respectively. The yields of products of hydrogenation and destruction of phenanthrene are 26% and 2.5%, respectively. According to the results of gas chromatography-mass spectrometric analysis of hydrogenates, the schemes of the hydrogenation reaction of model objects were drawn up.

Full Text

This preprint is available for [download as a PDF](#).

Tables

Due to technical limitations, table 1 is only available as a download in the Supplemental Files section.

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Scheme of phenanthrene hydrogenation reactions according to hydrogenated product composition

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Scheme of 2-butyl-naphthalene formation from tetrahydrophenanthrene

Supplementary Files

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