# Solid Acid Alkylation of Isobutane by Butenes: the Path from the Ascertainment of the Reasons for Fast Deactivation to the Technological Execution of the Process

**A. V. Lavrenov, E. N. Bogdanets, and V. K. Duplyakin**

*Institute of Hydrocarbon Processing, Siberian Branch of Russian Academy of Sciences*

**Abstract**—A short review of solid acid alkylation processes; the conception of the mechanism of goal and side conversion of isobutane and butenes, the deactivation nature of catalysts being used, and the possibility for their reactivation and industrial application is given. It was demonstrated that hydride transfer from isobutane molecules is the key process under which the catalytic cycles of alkylation retain and saturated hydrocarbons are formed as the process products. The main reason for the deactivation of alkylation catalysts is the formation of alkylcyclopentadienes and related compounds belonging to butenes. The problems of the fast deactivation of solid alkylation catalysts are substantially solved by the organization of catalyst performance in the connected reaction-regeneration system and in the application of hydrogenation and extraction procedures of activity regeneration, for which hydrogen and initial isobutane are used. Many companies incline to this kind of organizing of uninterrupted solid acid alkylation, which is an alternate to liquid acid alkylation.

**DOI:** 10.1134/S2070050409010073