

Pilot tests of a catalyst for the selective hydrogenation of methylacetylene and propadiene

Laskin A., Ilyasov I., Nazarov M., Lamberov A., Nazmieva I., Shatilov V., Bikmurzin A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

KGS-3 catalyst is tested in the selective hydrogenation of methylacetylene and propadiene contained in industrial pyrolysis propane-propylene fractions at a pilot installation in two successive adiabatic flow reactors equipped with immobile catalyst beds. The optimum technological conditions for hydrogenation are determined, ensuring a residual content of acetylene and diene admixtures of no more than 5 ppm: pressure in the system, 18 atm; hydrocarbon feedstock hourly space velocity (HSV), 2100 h⁻¹; molar ratio of hydrogen to the sum of methylacetylene and propadiene in the first and second reactors, respectively, 1.1 : 1.0 and 1.6 : 1.0; temperatures, 50 and 55 °C. Under these conditions, KGS-3 catalyst ensures 100% conversion of methylacetylene and propadiene with a propylene selectivity of 76.7%. The expected service life of this catalyst is about 14 months. The catalyst can be used for the purification of hydrocarbon fractions containing up to 5 wt % of acetylene and diene admixtures. © Pleiades Publishing, Ltd., 2013.

<http://dx.doi.org/10.1134/S2070050413030082>

Keywords

Pd/Al₂O₃ catalyst, Selective hydrogenation of methylacetylene and propadiene