

Pilot tests of a catalyst for the selective hydrogenation of acetylene

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Abstract

Pilot tests of SGA-2M promoted Pd/Al₂O₃ catalyst in the selective hydrogenation of acetylene are performed on an industrial ethane-ethylene fraction in a system of two serially arranged adiabatic flow reactors. The optimum process conditions under which the conversion of acetylene reaches 100% at a selectivity of 68.2% with respect to ethylene are determined: system pressure, 21 atm; hydrocarbon feedstock hourly space velocity (HSV), 1500 h⁻¹, carbon monoxide concentration, 7 ppm; H₂: C₂H₂ molar ratio at the first and second hydrogenation stages, 1.0: 1.0 and 1.4: 1.0; inlet temperature of the first and second reactors, 40 and 55 C, respectively. The interregeneration service life of the SGA-2M catalyst under optimum conditions is estimated at 12 months. SGA-2M catalysts can be recommended for purifying ethane-ethylene fractions containing up to 2 vol % of acetylene. © 2013 Pleiades Publishing, Ltd.

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Keywords

alumopalladium catalyst, selective hydrogenation of acetylene