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PRESSURE DROP AND MASS TRANSFER IN THE STRUCTURED CARTRIDGES WITH FIBER-GLASS CATALYST

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1 Abstract

The structured cartridges with glass-fiber catalyst (GFC) with axial flow of gaseous reactants were studied in terms of pressure drop and mass transfer limitations. The universal equation for calculation of the pressure drop for cartridges of the various design was proposed. Mass transfer intensity in the GFC cartridges was studied on the base of model reaction of ethylbenzene deep oxidation in air. The obtained data on external mass transfer coefficient may be described by the common criterial equation $Sh = 0.0695\ Re^{0.93}\ Sc^{1/3}$. According to the quality of the compromise between mass transfer efficiency and unit pressure drop the structured cartridges with glass-fiber catalysts were found to be one of the most promising forms of catalysts from the reaction engineering point of view.

2 Highlights

- Glass-fiber catalysts (GFCs) are the promising type of catalytic structures
- Pressure drop in different GFC cartridges may be described by common equation
- Criterial equation proposed for mass transfer coefficient in GFC cartridges
- GFC cartridges demonstrate the best ratio of mass transfer to pressure drop

3 Keywords

Glass-fiber catalyst, structured cartridge, mass transfer, pressure drop

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