

Institute of Chemical Engineering

Adres artykułu: <https://iich.gliwice.pl/en/article/solid-foams-as-a-structured-catalyst-support-for-catalytic-methane-combustion>

Solid foams as a structured catalyst support for catalytic methane combustion

Duration: 2019 - 2021

Description

Structured packing (e.g., solid foams or 3D structures with periodically repeating cells) is characterized by a large specific surface area available for the deposition of a catalytically active layer, high porosity (and therefore low flow resistance), and simultaneous intensive heat and mass transfer. The synergy of these properties and a highly active catalyst, obtained, for example, using a sonochemical method, should result in a significant intensification of the catalytic process and, in the future, measurable economic benefits. The proposed solution (solid foam with a sonochemically obtained catalyst layer deposited on its surface) has not been the subject of experimental studies; only a performance estimate based on one-dimensional reactor modeling was conducted. Experimental verification of the correctness of the simplified 1D modeling for the proposed solution will allow for its future application to complex 3D printed structures, significantly simplifying reactor optimization. Moreover, the direction of further development of the proposed solution will be indicated, especially those important to environmental protection, such as reducing volatile organic compound emissions and nitrogen oxides. In the future, this will enable the design of new catalytic converters.

Tagi: solid foams, reactor modelling, methane combustion

Metryczka

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