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Optimal catalyst texture in macromolecule conversion: a computational and experimental study

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Highlights

1. Evolution of catalyst texture in macromolecule conversion is estimated using Monte-Carlo methods and methods of the graph theory
2. Hierarchical texture prolongs the catalyst lifetime

Abbreviations:

HDAsph – hydrodeasphaltenization

HDM – hydrodemetallization

SSA – specific surface area

Abstract

Evolution of alumina catalyst texture during macromolecule conversion with an emphasis on heavy oil hydroprocessing was theoretically estimated using geometrical characteristics of the porous media that were in turn calculated via Monte-Carlo methods and methods of the graph theory. Two types of alumina texture have been modeled: unimodal mesoporous structure of conventional catalyst and bimodal meso-macroporous structure of the catalyst, which can be

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