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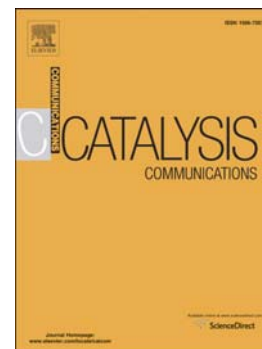
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Preparation of NbO_x/SiO₂-coated Structured Packing Material and its Catalytic Performance in the Gas-phase Beckmann Rearrangement of Cyclohexanone oxime to ϵ -Caprolactam

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Abstract

Potential industrial applicability of a NbO_x/SiO₂ catalyst material was strongly improved by fixing μ m-particles onto a structured packing. The granular catalyst displays a high catalytic performance in producing ϵ -caprolactam via gas-phase Beckmann rearrangement. However, applicability is strongly hampered because a high linear gas velocity and a small particle size are necessary to avoid diffusion limitations. These requirements would lead to an unacceptably high pressure drop in an industrial reactor. The novel NbO_x/SiO₂ structured packing catalyst displays, at high WHSV in a tube reactor, a constant high ϵ -caprolactam yield (96%) for at least 32 h time-on-stream, without any indication of deactivation.

Keywords: gas-phase Beckmann rearrangement, cyclohexanone oxime to ϵ -caprolactam, niobia on silica catalyst coating, structured packing, atmospheric pressure

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