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Innovative catalytic streamlined carriers with triangular channels

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The paper presents research on a novel catalytic carrier, called “streamlined structure”. The carrier is a short-channel monolith, whose walls are shaped like an airfoil profile (airplane wing). The intention is heat transfer intensification coupled with moderate flow resistance. Streamlined structures with triangular channel cross-section, 3mm, 6mm and 12 mm long, were designed and manufactured using the SLM (Selective Laser Melting) technique for the experimental verification. The structures were modelled using the CFD (Computational Fluid Dynamics) software to derive flow resistance, flow patterns and heat transfer coefficients. Compared to classic structures, CFD showed intensified heat transfer, combined with acceptable flow resistance increase. CFD proved the lack of an inlet vortex, which in classical structures seriously reduces the intensity of heat transfer. The CFD has been satisfactorily verified by experiments.

Metryczka

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