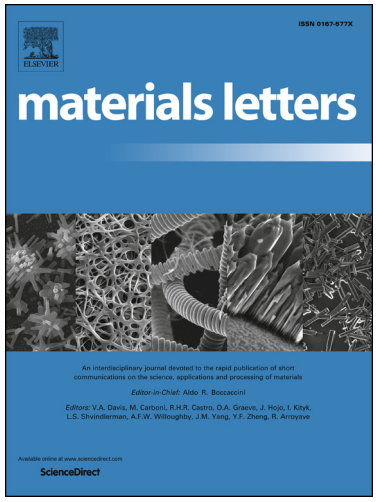

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Structured glass catalytic coating on wire mesh for particulate matter (PM) removal by modified sol-gel processing

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Abstract

K-containing soot oxidation catalysts are promising to reduce or replace noble metal usage in combustion engine emission abatement systems. In this paper, we introduce a facile approach for applying a K-containing glass catalyst onto structured wire mesh monoliths to achieve low temperature soot removal. A polyvinyl butyral (PVB) modified sol-gel process was developed to yield a crack-free thickness that is 6 times that of the conventional sol-gel process. An intermediate SiO_2 barrier layer was found to be effective to insure stability of the glass catalyst over extended cycling periods. The catalytically coated wire mesh can lower the soot ignition temperature (T_{ig}) to ~370^{o}C with O_2, and offers catalytic stability for long term combustion cycling.

Keywords: glass catalyst; potassium catalyst; sol gel coating; metallic substrate; particulate matter; soot oxidation