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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<sub>2</sub> 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°C with O<sub>2</sub>, and offers catalytic stability for long term combustion cycling.

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

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