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Title: Modifying Catalytically the Soot Morphology and Nanostructure in Diesel Exhaust: Influence of Silver De-NO_x Catalyst (Ag/Al₂O₃)

Authors: N. Serhan, A. Tsolakis, A. Wahbi, F.J. Martos, S. Golunski



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Modifying Catalytically the Soot Morphology and Nanostructure in Diesel Exhaust: Influence of Silver De-NO_x Catalyst (Ag/Al₂O₃)

N. Serhan^a, A. Tsolakis^a, A. Wahbi^a, F.J. Martos^b, S. Golunski^c

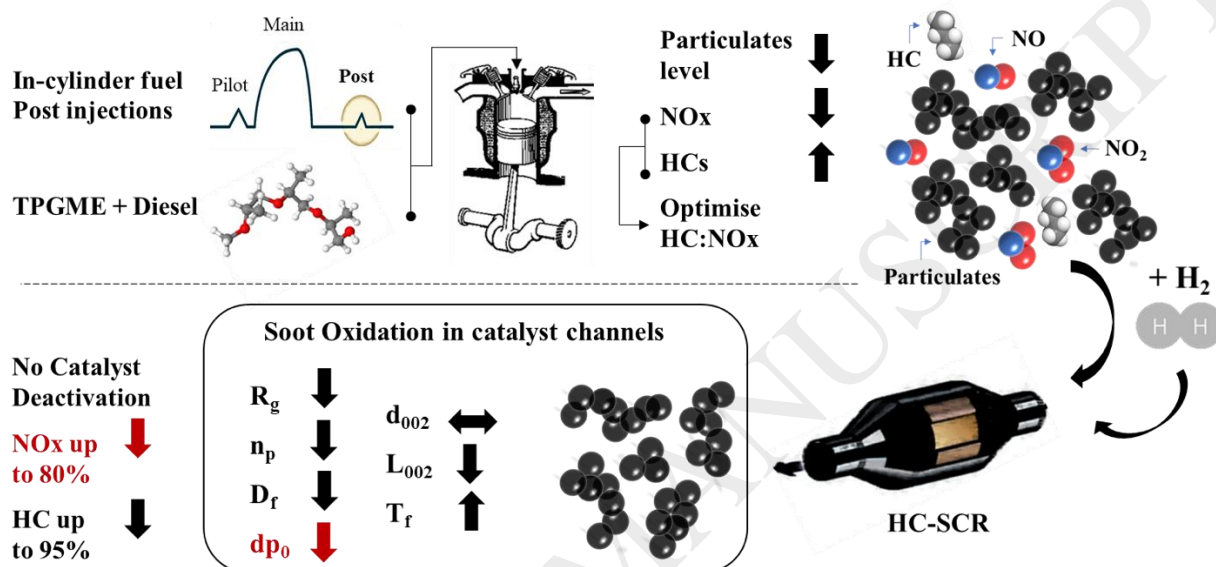
^a Mechanical Engineering, University of Birmingham, Birmingham B15 2TT, UK

^b Escuela de Ingenierías Industriales, University of Málaga, 29071 Málaga, Spain

^c Cardiff Catalysis Institute, School of Chemistry, Cardiff University, Cardiff CF10 3AT, UK

Graphical Abstract for the paper with title:

“Modifying Catalytically the Soot Morphology and Nanostructure in Diesel Exhaust: Influence of Silver De-NO_x Catalyst (Ag/Al₂O₃)”



Highlights:

- Exhaust PM are catalytically oxidised in the presence of small H₂ addition
- Exhaust PM adhere to each other within the catalyst channels in the absence of H₂
- Fuel post-injection provides sufficient HCs to effectively reduce NO_x
- H₂ should be adequately optimised to avoid any unwanted oxidation of the HCs
- Impact of post-injection on PM characteristics have been carried for diesel and T20

Abstract

The influence of an Ag/Al₂O₃ HC-SCR catalyst on the morphological and nanostructural aspects of the exhaust particulate matter (PM) generated during the combustion of diesel fuel and a glycol ether–diesel fuel blend was addressed in this research work. In addition, the impact of in-cylinder fuel post injections (FPI) on the particulate formation pathway and on the catalytic de-NO_x efficiency was also studied.

The tests were carried at low exhaust temperatures in the absence and presence of small amounts of hydrogen (H₂). It is concluded that in the absence of H₂, the catalyst does not modify the primary particle size (dp₀) of the soot aggregates, while the aggregation of the soot particles throughout the catalyst channels is the main governing mechanism. The catalyst influence on the particulate structure was evident when H₂ was introduced,

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