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Title: Modifying Catalytically the Soot Morphology and Nanostructure in Diesel Exhaust: Influence of Silver De-NOx Catalyst (Ag/Al_2O_3)

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Modifying Catalytically the Soot Morphology and Nanostructure in Diesel Exhaust: Influence of Silver De-NOx Catalyst (Ag/Al_2O_3)

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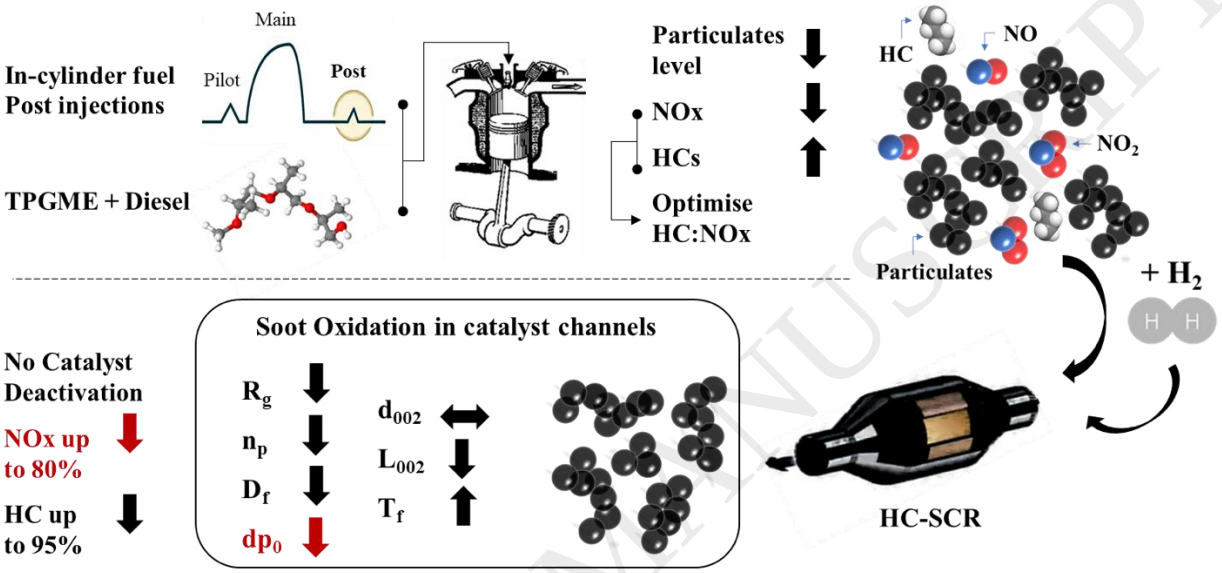
Graphical Abstract for the paper with title:

"Modifying Catalytically the Soot Morphology and Nanostructure in Diesel Exhaust: Influence of Silver De-NOx Catalyst (Ag/Al_2O_3)"



Highlights:

- Exhaust PM are catalytically oxidised in the presence of small H_2 addition
- Exhaust PM adhere to each other within the catalyst channels in the absence of H_2
- Fuel post-injection provides sufficient HCs to effective the HC-SCR of NOx
- H_2 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/Al_2O_3 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-NOx efficiency was also studied.

The tests were carried at low exhaust temperatures in the absence and presence of small amounts of hydrogen (H_2). It is concluded that in the absence of H_2, the catalyst does not modify the primary particle size (dp_0) 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 H_2 was introduced,