



Water resistant Fe-Mn based Catalyst for NO_x abatement at Low Temperature

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Abstract:

Selective Catalytic Reduction (SCR) technology is largely used in industries for NO_x abatement. However, some compounds such as water and sulphur oxides present in flue gases can often lead to catalyst deactivation. Even under dry conditions the SCR reaction produces water, which can possibly occupy active sites and decrease catalytic efficiency. This effect is more significant when the operating temperature is below 200 °C. Accordingly, there is a need for developing water resistant catalysts for NO_x abatement. This work aims for adding hydrophobic agents to a Fe-Mn based catalyst preparation in order to conserve its efficiency at low temperatures and wet conditions.

Two agents have been tested for this purpose: polytetrafluoroethylene (PTFE) and fluorinated carbon (FC). PTFE was used during the coating process by testing two approaches: 1) a PTFE layer is coated after catalyst coating onto a monolith support; 2) PTFE and catalyst powder were both mixed during slurry precipitation and then used for monolith coating. FC was also used and incorporated into the catalyst under similar approach. These coated monoliths were characterised by means of contact angle (measure of hydrophobicity), surface area, XRD etc. Lastly, catalyst performance tests were conducted under various simulated industrial flue gas conditions in a catalytic reactor system.

Biographical Statement of speaker:

I am a Brazilian student attending the third year (master in process engineering) at École Nationale Supérieure de Chimie de Paris (ENSCP) and I've previously studied three years and a half of Chemical Engineering at University of Campinas (Unicamp) in Brazil.