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APPILCATION OF MESOPOROUS MATERIALS BY MODIFIED SURFACE PROPERTIES FOR THE SELECTIVE CATALYTIC REDUCTION OF NO WITH HYDROCARBON

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This study has been focused on the comparison of de-NOx mechanisms and surface physical properties between Pt impreganated MCM-41 and MCM-48 with different framework dimension. In de-NOx reaction, the NO reduction from 250ºC with reducing reagent (propylene) in both catalysts. However the conversion has its maximum (60%) of NO and then declined as temperature increasing further at 300ºC in the case of Pt/MCM-41, on the other hand, in the case of Pt/MCM-48 the maximum activity remained constant up to 550ºC. This result supposed to be attributed to the differences in structural dimension, surface acidity, and adsorption abilities between two different kind of meso-porous materials, say, MCM-41 and MCM-48. The adsorption ability for NO, reducing agent (propylene), and NH3 were founded to be superior on Pt/MCM-48 to those on Pt/MCM-41. Through the XPS and XRD analysis, it could be suggested that both of the PtO and PtO2 take role of active species on Pt/MCM-48, while the PtO only presented on Pt/MCM-41. From the results of Physical properties mentioned above and in-situ IR spectra, it could be concluded that the de-NOx reaction in Pt/MCM-41 was progressed by partial oxidation and reduction by reducing agent and NO, respectively, and resulting in production of NCO and CxHyOz intermediates. However, it was occurred though the completely oxidation and reduction of these on Pt/MCM-48.