

Towards practical application of lanthanum ferrite catalysts for NO reduction with H₂

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Description

A series of perovskite-type catalysts (LaFeO_3 , $\text{La}_{0.8}\text{Sr}_{0.2}\text{FeO}_3$, $\text{Pd}/\text{La}_{0.8}\text{Sr}_{0.2}\text{FeO}_3$, $\text{La}_{0.8}\text{Sr}_{0.2}\text{Fe}_{0.9}\text{Pd}_{0.1}\text{O}_3$, $\text{La}_{0.7}\text{Sr}_{0.2}\text{Ce}_{0.1}\text{FeO}_3$, $\text{Pd}/\text{La}_{0.7}\text{Sr}_{0.2}\text{Ce}_{0.1}\text{FeO}_3$ and $\text{La}_{0.7}\text{Sr}_{0.2}\text{Ce}_{0.1}\text{Fe}_{0.9}\text{Pd}_{0.1}\text{O}_3$) has been prepared by the solution combustion synthesis method and fully characterized by XRD, BET, FESEM and TPD/R analyses. The performance of these catalysts towards the NO reduction mechanism by H₂ has been evaluated in a temperature-programmed reaction apparatus (TPRe) in the absence and in the presence of oxygen. The catalysts have been studied in the 25–350 °C temperature range, and significant catalytic activities were measured at 150–250 °C. Among the catalysts screened, $\text{La}_{0.8}\text{Sr}_{0.2}\text{Fe}_{0.9}\text{Pd}_{0.1}\text{O}_3$, showed the best performance. Hence, it was deposited directly over a ceramic honeycomb monolith by *in situ* SCS, tested in a lab-scale test rig, then submitted to the specific ageing protocol ...