

Sinter-resistant $\text{SiO}_2@\text{Pd}@\text{CeO}_2$ nano-composite catalyst for carbon monoxide and propylene oxidation

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Automobiles exhaust harmful air pollutants so that considerable researches on automotive catalysts, especially on the oxidation of CO and HC, have been proceeded.

Pd is well-known oxidation catalysts for removal of CO and HC. Ceria is widely used as a support due to its abilities to enhance oxidation activity and to promote noble metal dispersion.

Since catalytic converters in automobiles are exposed to severe condition, developing sinter-resistant catalyst is main issue for recent studies. High temperature reaction condition results in obvious decrease of its catalytic activity due to sintering of Pd.

The objective of this work is to maintain activity of Pd catalysts by encapsulating Pd with mesoporous CeO_2 . As well as thermal stability of catalysts by CeO_2 encapsulation, suggested nanostructure can improve catalytic activity of Pd in CO and HC oxidation due to its synergistic interaction with CeO_2 . Here we report synthesis of CeO_2 -shell nano-composite catalyst to prevent sintering of Pd.