

Ce/Zr ratio effect in Pd supported catalyst for sulfur resistance

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To satisfy emission standard, diesel engine has adopted diesel oxidation catalyst (DOC) which converts unburned CO and HCs to CO<sub>2</sub> and H<sub>2</sub>O. Improvement of catalytic performance at low temperature is essentially required. In addition to the thermal stability, the sulfur resistance is a challenging issue for the proper operation of catalyst. Pd plays a key role as an active site for oxidation. Moreover, it is known that Pd has excellent synergistic effect on oxidation when CeO<sub>2</sub> is used as support. CeO<sub>2</sub> support is able to provide high dispersion of Pd and, moreover, to promote the oxidation activity due to its characteristic oxygen storage capacity (OSC). However, CeO<sub>2</sub> is prone to be deactivated by hydrothermal treatment. In addition, it is reported that SO<sub>2</sub> easily degrades catalytic property of CeO<sub>2</sub>. There have been a number of studies to maintain CeO<sub>2</sub> property against thermal deterioration and sulfur poisoning. Among the various solid solution materials, (Ce-Zr)O<sub>2</sub> presents high thermal stability and OSC ability. This study aims at interpreting the effect of ZrO<sub>2</sub> in Pd/(Ce-Zr)O<sub>2</sub> catalysts with various Ce/Zr ratios compared to Pd/CeO<sub>2</sub>, especially focusing on the effect of sulfur poisoning & regeneration treatment on the catalyst.