

Solid Catalyst for Environmental Friendly Chemistry

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HOMEPAGE

<http://www.apchem.nagoya-u.ac.jp/06-BS-6/satsumaken/index.html>

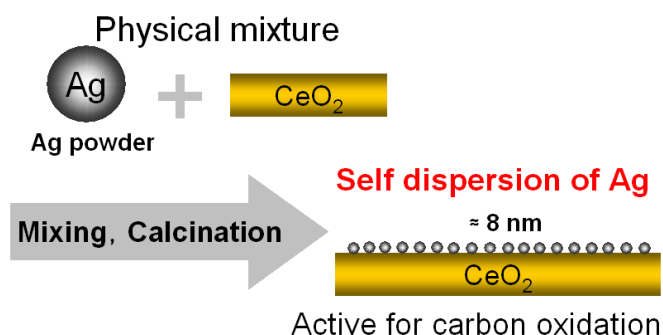


Prof. Atsushi Satsuma

The target of our laboratory is development of solid catalysts for environmental friendly chemical processes, biomass conversion to useful chemicals to achieve sustainable society, and reduction of pollutants. One of the approaches is the use of nano-sized clusters of metals and metal oxides, which often show very unique roles in adsorption and chemical reactions, to automobile catalysts, organic synthesis and gas sensors. Our research on development of catalysts is supported by the analysis of reaction mechanism of catalysis using various physico-chemical techniques and DFT calculation.

Nano-cluster Ag as Automobile Catalyst

We found that nano-sized Ag clusters are effective for the reduction of NO_x and particulate matter in diesel exhausts. These nano-clusters are potentially the long-life and durable because of self-assembly under the reaction condition. Catal. Sci. Tech. 1(2011) 1331. Appl. Catal., B, 96 (2010) 169.



Biomass Conversion by Solid Catalysts

Cellulose is a promising alternative as the most abundant source of biomass and can be supplied from non-edible sources. For the effective utilization of cellulose derived biomass materials, we are studying hydrolysis of cellulose into saccharides by solid acid, and dehydration of saccharides into HMF. Catal. Commun., 10 (2009) 1849. Green. Chem., 11(2009) 1627.

