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Yuantao Ning is a Professor of Physical Metallurgy at Kunming Institute of Precious Metals, China. His main research interests are related to the principles of alloying and new materials based on precious metals, particularly platinum metals and their alloys, including ones modified by the rare earth metals. He has published around 200 papers in national and international periodicals and won national prizes for his scientific achievements.

Platinum Nanoparticle Catalysts

Supported catalysts are usually prepared by impregnating water soluble metal salts on a porous support, followed by drying, calcining and reduction. This produces well-dispersed catalysts with particles in the nm range having high activity and good thermal stability. However, the particle size distribution is wide and only limited control is achievable, making size-linked interpretation of catalytic mechanisms difficult. Therefore, for better control, different methods of preparation are under investigation.

Researchers in Sweden have examined the deposition of Pt nanoparticles, prepared in water-in-oil microemulsions, on γ-Al_2O_3 (H. H. Ingelsten, J.-C. Béziat, K. Bergkvist, A. Palmqvist, M. Skoglundh, H. Qiuhong, L. K. L. Falk and K. Holmberg, *Langmuir*, 2002, **18**, (5), 1811–1818). In one method, based on work by Boutonnet *et al.*, the γ-Al_2O_3 was added to the Pt particle suspension and the microemulsion was then destabilised by adding tetrahydrofuran (THF), which deposited the Pt particles onto the support. In a second method, Pt nanoparticles were transferred to an aqueous solution and stabilised by a surfactant prior to adding γ-Al_2O_3. Both catalysts had high activity for CO oxidation by oxygen, but some particle agglomeration had occurred. This was due to a too-rapid addition of THF, and inefficient redispersion of the primary Pt particles on transfer to the aqueous phase, respectively. Further work is suggested on the choice of pH, surfactant and control of the electrostatic interaction between the Pt particles and the γ-Al_2O_3.