

Surfactant Free Synthesis of Platinum Nanoparticles for (Electro) Catalysis

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A toolbox for systematic studies of (electro) catalysts has been developed. The synthesis of colloidal suspensions of platinum nanoparticles (Pt NPs) is controlled separately from their immobilisation on support materials. The influence of properties like size, nature of support, loading, distribution of the Pt NPs on a support material etc. can then be optimised independently. The resulting benefits for heterogeneous catalysis can then be assessed in a systematic manner.

In this talk, the latest developments of this toolbox are highlighted. First, various ways to control the synthesis of Pt NPs using the surfactant free ethylene glycol process are presented. A specific focus is given to the size control of the NPs. Second, the NPs are shown to be suitable catalysts for electrochemical reactions like the oxygen evolution reaction after immobilisation on carbon supports or chemical transformations like the hydrogenation of 2-butanone to 2-butanol after immobilisation on alumina. Finally, further promising development of the toolbox for optimization of supported catalysts are discussed.

Biography:

Dr Jonathan Quinson is a Marie-Curie Individual Fellow at the University of Copenhagen, Denmark. He works on the surfactant free synthesis of nanoparticles for improved (electro) catalysis. He holds a M Sci from ESPCI ParisTech, Paris, France and a M Res in Green Chemistry from Imperial College, London, UK. He did his PhD at the University of Oxford, UK in materials science and bio-electrochemistry before joining the group of Prof Matthias Arenz in Copenhagen. His research interests are (nano) materials science (e.g. 'green' synthesis and characterisation) and energy (e.g. electrochemical processes).