

Catalysis with gold and gold palladium nanoparticles

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Heterogeneous catalysis plays a major role worldwide, not only with respect to an economic viewpoint, but it also provides the necessary infrastructure for the well being of society as a whole. A key discovery in the last two decades has been the identification that gold, when prepared as supported nanoparticles, is exceptionally effective as a redox catalyst. To some extent this observation is counter intuitive since extended gold surfaces do not chemisorb oxygen, nor do they corrode. In the early to mid 1980s it was discovered that gold was in fact a very active catalyst for CO oxidation and acetylene hydrochlorination [1]

Recently, there has been an explosion of interest in gold as a catalyst and gold catalysis is now a major topic for both heterogeneous and homogeneous catalysis worldwide. This presentation will explore the latest developments using supported gold and gold palladium nanoparticles as heterogeneous catalysts. This will include recent studies on the nature of the active site for CO oxidation [2] where recent aberration-corrected microscopy has revealed that the active species may involve only 7-10 gold atoms, and the direct synthesis of hydrogen peroxide [3] and the oxidation of toluene [4].

References

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