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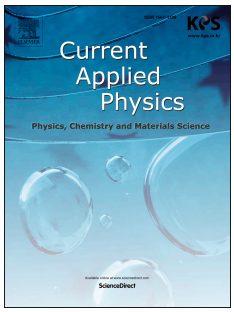

Nanoporous gold: Preparation and applications to catalysis and sensors

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Nanoporous gold: preparation and applications to catalysis and sensors

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Abstract

Preparation and applications of nanoporous gold (NPG) was reviewed. Various preparation methods of NPG and its structure were first discussed. Then, two basic characterization methods for morphology and surface area of prepared NPG structures were discussed. As for applications of NPG, studies regarding catalysts and sensors were surveyed. First, for catalysis, CO oxidation and hydrogen oxidation were reviewed. Regarding CO oxidation, detailed studies on reaction mechanisms and density functional theory (DFT) calculations were also discussed. For hydrogen oxidation, the effect of adding metal oxide nanoparticles on NPG was discussed. As for sensor applications, non-enzymatic and amperometric electrochemical sensing of aniline and phenol were reviewed. Due to its nanostructures, NPG had superior properties of antifouling effect and enhanced response signals and good enough stability that enabled amperometric sensing.

Keywords: Nanoporous Gold, Catalysis, Sensor