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Growth of catalytic Au nanoparticles upon electrochemical ageing

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Au nanoparticles, potential catalysts in fuel cells, were produced following a published chemical method. As-made nanoparticles were then adsorbed to carbon black supports and an electrochemical ageing sequence was applied. Of interest to this study was to observe and quantify the long term stability of Au nanoparticles upon ageing and as a function of nanoparticle size. To this end X-ray absorption spectroscopy and complementary methods were applied. Interestingly, it was found that small (2.4 and 3.1 nm diameter) nanoparticles grew in size as a result of the ageing process, whilst larger (4.6 nm) nanoparticles did not grow appreciably. Our results have implication on the suitability of Au nanoparticles as commercially viable catalytic material.

Keywords

nanoparticles, catalysis, electrochemistry

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