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Molecule-like Redox Activity and Size-dependent Electrocatalysis of Inorganic Hybrid Nanoparticles

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The development of low-cost, robust and high-efficient nanoscale electrocatalysts is arguably a dream approach to the use of nanomaterials as key building blocks in design and construction of chemical and biological sensing devices as well as fuel cells. Electroactive nanoparticles are a type of nanoparticles that have intrinsic electroactivity. One of representative examples is the nanoparticles composed of *Prussian Blue* or/and its analogues. This type of nanoparticles has advantages over classic electrocatalysts in several regards. In this communication, we present some of our recent efforts on synthesis, characterization, and electrocatalytic function of *Prussian Blue* nanoparticles (PBNPs). Molecule-like redox activity and size-dependent electrocatalysis are clearly revealed, which could offer crucial clues for further optimization of design of nanoscale electrocatalysts and their applications in sensors.

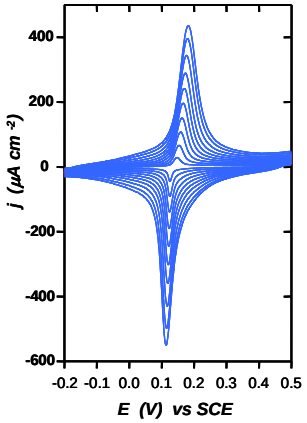

Fig. 1 Cyclic voltammograms of PBNPs immobilized on an Au(111) surface. Scan rates 0.1 to 1.0 V s^{-1}.

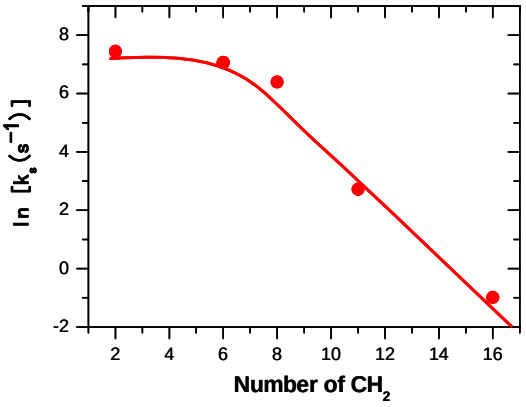

Fig. 2 Distance-dependent ET kinetics clearly showing the feature of tunnelling mechanism.

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