

Investigation of highly active PtCo nanocatalysts by X-ray absorption spectroscopy and its application towards oxygen reduction

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Carbon supported PtCo catalysts with structurally ordered face-centered tetragonal ( $L1_0$ ) phase was prepared by developed route. This catalyst exhibits superior catalytic activity and stability for oxygen reduction reaction. The carbon supported PtCo nanoparticles with ordered face-centered tetragonal structure (denoted as fct-FePt/mc) were obtained by the developed method.

The face-centered tetragonal PtCo structure was studied by X-ray absorption spectroscopy. The XANES spectra of Co K-edge shows characteristic features which indicate the formation of chemically ordered PtCo structure. The extracted structural parameters indicate high alloying extent of Pt with Co atoms. The synthesized fct-PtCo catalyst exhibits 1.7-fold higher mass activity than that of disordered PtCo and commercialized E-TEK PtCo catalysts. In the accelerated degradation test, the fct-PtCo catalyst shows better stability and activity retention of 74% compared to 50% of disordered PtCo.