Synthesis of Ru(IV) modified Pt/C electrocatalyst and its application for enhanced methanol electrooxidation

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Commercial Pt/C was modified with Ru (IV) species via the hydrolysis of Ruthenium (III) nitrosyl nitrate under a hydrothermal condition. It was revealed that the Pt nanoparticles were surrounded by Ru (IV) species and the presence of Ru (IV) species modified the electronic structure, which lowered the binding energy of Pt atoms. The results from the methanol electrooxidation suggested that the current intensity was increased and at the same time, the onset potential was decreased largely in the presence of Ru(IV) species modified Pt/C, which demonstrated the fact that the Ru (IV) species could activate the water molecules to provide the OH* to remove the CO_{ads} at low potential.

Keywords: Commercial Pt/C; Ru (IV) species; chemical modification; catalytic electrooxidation

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