Carbon Supported Pt+Os Catalysts for Methanol Oxidation

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11% Pt/C, 10% Pt + 1% Os/C, 9% Pt + 2% Os/C, 8% Pt + 3% Os/C, 7% Pt + 4% Os/C, 6% Pt + 5% Os/C and 5% Pt + 6% Os/C catalysts have been prepared for methanol oxidation reaction. Transmission electron microscopy, X-ray photoelectron spectroscopy, X-ray diffraction and cyclic voltammetry have been used to understand the nature of the species present in these catalysts. 7% Pt + 4% Os/C was the most active catalyst, while 8% Pt + 3% Os/C was the least active one. It is found that the metal particle size and distribution on the carbon support, the surface composition and the oxidation states of the metal particles, the metal-metal and metal support interactions are important parameters to define the activity of the catalyst.