Synthesis and characterizations of platinized WC nanoporous materials as an electro-catalyst for methanol oxidation

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Tungsten carbide based materials have been considered as an electrocatalysts for methanol oxidation because of their platinum-like catalysis and high CO resistance in various reactions. In this study, WC nanoporous materials were synthesized by heating mixtures of RF polymer (Carbon precusor) and AMT (Tungsten precusor). Platinized WC nanoporous materials were fabricated by conventional borohydride method. The characterizations of pure and platinized WC nanoporous materials were analyzed by XRD, PSD, FE-SEM, HR-TEM, TPD and Cyclic voltammetry. The BET surface area is 76m^2/g and total pore volume is 0.24cm^3/g. Pt particle size on 7.5wt% Pt loaded WC nanoporous catalysts is about 4.5nm by Debye-Scherrer equation. Especially, the mass activity (mA/mg of Pt taken at 0.75V – Ag/AgCl) of 7.5wt% Pt loaded WC nanoporous for methanol oxidation is higher by a factor of 3.2 than commercial catalyst (20wt% PtRu/C) in half cell test.