Se-doped Porous Carbon Supported Pt Nanocatalysts for Selective Ethylene Glycol Oxidation to Value-added Chemicals

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Selective electro oxidation of ethylene glycol has been investigated to produce high value-added chemicals, such as glycolic acid (GCA), oxalic acid (OA), glyoxylic acid (GOA) and formic acid (FA). In this study, we present a Se-doped porous carbon supported Pt catalyst (Pt/SePC) prepared through a modified polyol method as a highly active catalyst for the ethylene glycol selective oxidation. The morphology and crystallographical information of catalysts are investigated by scanning electron microscopy (SEM) and X-ray diffraction (XRD). The reaction conversion and the product selectivity were identified using high performance liquid chromatography (HPLC). Glycolic acid was observed in significant quantities at every voltage and it was demonstrated that the selectivity of GCA could be tuned by doping Se atom in carbon materials. Our study provides novel guidance for the rational design of electrocatalysts and for promising chemical transformation of ethylene glycol to value-added compounds.