Short Communication

Investigation of Pt/SnO₂/C Catalyst for Dimethyl Ether Oxidation in DDFC

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The performance of Pt loading on SnO₂/C support catalyst has been investigated for dimethyl ether (DME) oxidation in direct dimethyl ether fuel cells (DDFCs). The transmission electron micrograph (TEM) tests show that the sizes of Pt particles loading on different supports (SnO₂/C and XC-72 carbon black) are nearly the same (3.2 nm). The cyclic voltammograms results reveal that Pt/SnO₂/C shows higher activity towards DME oxidation. DME prefers to be adsorbed on Pt/SnO₂/C surface. SnO₂ can adsorb OH_{ads} species which benefit to reduce the Pt poisoning effect. The maximum power density of DDFC has been enhanced by using Pt/SnO₂/C as the anodic catalyst. The electrochemical active surfaces (EAS) of different anodes are nearly the same. That is, the improvement of DDFC performance can be attributed to the enhanced activity of anode catalyst.

Keywords: Direct dimethyl ether fuel cell; Dimethyl ether; Anode catalyst; Supports; Pt/SnO₂/C

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