Development of AgVO$_3$/C electrocatalysts for an ethanol-tolerant in alkaline electrolyte for direct ethanol fuel cells

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Abstract: Electrochemistry activity characterization was conducted by cyclic voltammetry (CV) and oxygen reduction reaction (ORR). The AgVO$_3$/C, V$_2$O$_5$/C and Ag/C electrocatalysts displayed ethanol tolerance for oxygen reduction reaction with the presence of ethanol in KOH working electrolyte. As a result, electrocatalysts prevented ethanol oxidation reaction from ethanol crossover via membrane from the anode to cathode compartments in alkaline direct ethanol fuel cells (ADEFCs). The AgVO$_3$/C electrocatalyst was also achievable at a lower cost than non-Pt catalysts. The results presented herein demonstrated that the AgVO$_3$/C electrocatalyst is significant for development and may be useful in place of the state-of-the-art ORR platinum electrocatalyst.

Keywords: Alkaline direct ethanol fuel cell; Oxygen reduction reaction; Ethanol-tolerant; Silver and vanadium oxides; Vanadium oxides