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Synthesis and characterization of multi-metallic electrocatalysts with pencil core substrate for electro-oxidation of alcohols in fuell cells

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Abstract:

In this research, silver-platinum bimetallic nanoalloys electrocatalyst was prepared on nitrogen-dop graphene pencil core (NDGPC) by electrochemical deposition method.[1,2] This electrocatalyst was characterization by SEM, EDS and EDS-mapping analysis and was used in two processes of ethanol electro-oxidation and glycerol electro-oxidation in alkaline media for use in direct ethanol fuel cells (DEFC) and direct glycerol fuel cells (DGFC).[3] The synthesized electrocatalysts showed good results in terms of potential, current density and stability for the mentioned alcohols. In general, electrochemical synthesis methods have advantages including easy synthesis, no need for high temperature and pressure (synthesis is done at room temperature and pressure), green and pollution-free and etc.[4]

Keywords: Electrodeposition, nitrogen-dop graphene, pencil core, Electrocatalyst, Nanoalloys

Refrences:

[1] K. Chen, D. Xue, S. Komarneni, Nanoclay assisted electrochemical exfoliation of pencil core to high conductive graphene thin-film electrode, J. Colloid Interface Sci. 487 (2017) 156–161.

[2] M.B. Lopez, J. Ustarroz, Electrodeposition of nanostructured catalysts for electrochemical energy conversion: Current trends and innovative strategies, Curr. Opin. Electrochem. 27 (2021) 100688.

[3] R. Rajeev, B. Sharma, A.T. Mathew, L. George, Y.N. Sudhakar, A. Varghese, electrocatalytic oxidation of alcohols using chemically modified electrodes: a review, J. Electrochem. Soc. 167 (2020) 136508.

[4] R.A. Sheldon, I.W.C.E. Arends, G.-J. Ten Brink, A. Dijksman, Green, catalytic oxidations of alcohols, Acc. Chem. Res. 35 (2002) 774–781.