عنوان مقاله:

Electrochemical study of modified Poly(styrene-co-maleic anhydride) as new metal free electrocatalyst for oxygen reduction reaction in acidic media

محل انتشار:

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خلاصه مقاله:

Fuel cells are considered to be one of the most promising clean energy technologies that can helpresolve the energy crisis and problems of environmental pollution. However, the potential of their widespread application is seriously limited by the slow kinetics in cathode especially in lowtemperature fuel cells which required high price of metal-based electrocatalysts such as Pt [۱, ۲].As promising alternatives, metal-free carbon materials, especially upon doping heteroatoms or creating defects demonstrated excellent oxygen reduction reaction (ORR) activity, which is asefficient as or even superior to commercial platinum on carbon. Significant progress on the development of advanced carbon materials as highly stable and durable catalysts has beenachieved, but the catalytic mechanisms of these materials still remain undistinguished [۳]. In thepresent work, modified poly(styrene-co-maleic anhydride) with ۲-aminopyrimidine (PSMI) wassynthesized and the conversion of maleic anhydride moiety in SMA to maleimide was confirmed by FT-IR and ۱HNMR spectrometer. For electrochemical study of prepared electrocatalyst for ORR, the reaction layer of the electrode was prepared by mixing PSMI and Vulcan XC-۷۲R. Foroptimizing the electrocatalyst in the reaction layer of prepared electrodes, the various loadings (۱۰to ۹۰ %) of PSMI was used. The fabricated electrodes were investigated by electrochemicaltechniques such as cyclic voltammetry (CV) and linear sweep voltammetry (LSV) in an acidic media. The results showed that PSMI with ۵۰% loading in the reaction layer of prepared electrode can provide better performance for ORR in acidic media.

کلمات کلیدی:

Metal Free Electrocatalyst, ORR, Modified Poly(Styrene-co-maleic anhydride), Fuel Cell