Ag/Pd Bimetallic Nanoparticle Modified Carbon Ionic Liquid Electrode for Electrocatalytic Oxidation of Ethanol in Alkaline Medium

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Direct liquid fuel cells, such as direct alcohol fuel cells (DAFCs), have attracted much attention as one of the most viable candidates to replace batteries as a source of portable power. Among the various liquid fuels, ethanol is less toxic, has the higher energy density, its ease to store and handle than methanol. In the alkaline-type DAFCs, the less expensive Pd-based catalysts have a comparable or even better electrocatalytic activities than Pt-based catalysts for alcohol oxidation, especially for ethanol oxidation [1-2]. In this paper, Different Ag/Pd nanoparticle alloys were synthesised with ionic liquid microwave-assisted method and used it in carbon ionic liquid electrode (CILE).results showed incorporation of silver in palladium and apply ionic liquid in construction of electrode as binder, improve electrocatalytical behavior of palladium for electrooxidation of ethanol. These two components caused negative shift of onset and peak potential, increase current peak and decrease of J_{bp}/J_{fp}. Among Ag/Pd/CILE, Ag/Pd(30:70) CILE has better electrocatalytical behavior , the electrode reveals excellent catalytic characteristic such as high catalytic activity, stability, tolerance toward poisoning effects and capacity for electrooxidation of ethanol in alkaline medium. All results show that this electrode material is very attractive for direct ethanol fuel cells.

References

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