

Size-controlled Electrochemical Synthesis of Palladium Nanoparticles Using Morpholinium Ionic Liquid

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An electrochemical reduction method for preparing metal nanoparticles has been proven to have some advantages over the chemical reduction method: the particle size can be tuned through an easy operation by varying the current density and electrolysis duration; and it is possible to obtain boride-free nanoparticles due to the lack of a requirement for a reductant such as NaBH₄. In this study, we developed the electrochemical synthesis of palladium (Pd) nanoparticles using morpholinium salts. The particle sizes were precisely controlled by the adjustment of the current density and temperature. The average sizes were 2.2, 2.4, 2.9, 3.5, 3.9, and 4.3 nm, and all prepared particles showed a crystalline structure.