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Abstract
This article demonstrates that the nano-scale metal particles were synthesized via electrochemical technique with two kind surfactants (CTABr、D12TABr). Metal atoms are usually wrapped by surfactant micelles in order to form metal nano-particles. The auxiliary surfactant (D12TABr) concentration, applied voltage and growth temperature are playing important roles in formation of metal nano-particle. Also, we found that the auxiliary surfactants added into growth solution are resulted in increasing aggregation number of micelles and surfactant colloid condensation. The surfactant colloid condensation is increased with decreasing the size of the micelles when auxiliary surfactant concentration is increased from 1 to 30 mg. The size of metal nano-particle is found to increase linearly with the growth temperature due to increasing space available for solubilization in the micelle. Furthermore slow transport depended on applied voltage for gold ion is conducive to formation of metal nano-particle in growth solution; typically we find that that applied voltage in our study can be obtained at 2.5 V. An average particle size about 6.4 nm is obtained in primary surfactant (CTABr) with 3 ml (0.08M), auxiliary surfactant (C48H100BrN) with 30 mg, electrolysis time with 25 minutes, and acetone with 10 μl. Finally, we can successfully synthesis compound nano-particles.
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