

Active Oxygen Scavenging of Gold and Platinum Nano-Colloids Protected by Amphiphilic Dendrimers with Multi-Sugars

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Tadpole-type amphiphilic dendrimers with poly(amidoamine) (PAMAM) dendrons and a single alkyl chain (alkyl chain length = 16, generation number = 1–5) were designed and synthesized, and investigated their adsorption and aggregation properties using surface tension, fluorescence of pyrene, dynamic light scattering (DLS), and small-angle neutron scattering (SAXS). The amphiphilic dendrimers exhibit low critical micelle concentration and high efficiency in lowering the surface tension of water, indicating that the dendron-head moieties were more efficiently packed at the air-water interface and in solution. The DLS and SANS show that the amphiphilic dendrimers form small micelles in aqueous solution regardless of the generation and the concentration. Gold and platinum nanoparticles were prepared by chemical reduction protected by tadpole type amphiphilic dendrimers, and their catalytic activities for reduction reaction of *p*-nitrophenol and DPPH radical scavenging reaction were investigated. It was found that the catalytic activities for reduction reaction were significantly influenced by the dendrimer generation and the size of nanoparticles.