One-step synthesis of Pt nanoparticles using antioxidant gallic acid and its subsequent dispersion on multiwall CNTs

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Platinum nanoparticles(Pt-NPs) play a crucial role in a wide variety of applications, especially in the field of catalysis and fuel cell technology. However, given the high price of Pt, we should find ways to reduce the amount of Pt required. Multi-wall carbon nanotubes (MWCNTs) have been found to be efficient as heterogeneous catalyst supports and can be readily applied for Pt-NPs deposition. In this research, we present the synthesis of Pt-NPs using gallic acid and a simple method for the dispersion of Pt-NP on MWCNTs. The samples were characterized using TEM, XRD, and XAS techniques. TEM analysis displayed the presence of spherical PtNPs(20-30 nm)and Pt-CNT showed well dispersed Pt-NPs(1-2 nm) on the surface of MWCNTs. XRD spectra showed the presence of pure crystalline PtNPs. In addition, XAS studies were performed in order to understand the nature of reactivity of Pt ions.