In this work we report a method for incorporation of gold nanoparticles capped with sodium citrate on pseudoboehmite and its stabilization at high temperature. Here we present the adsorption performance of pseudoboehmite as well as the stabilization of the gold nanoparticles at different temperatures. After the adsorption of GNPs, the obtained product was brought under thermal treatment at 100 °C, 500 °C and 1000 °C. The characterization was carried by means of XRD, UV-vis, SEM, TEM, FTIR and Raman spectroscopy. Heat treatments at 500 °C and 1000 °C induced the transformation of pseudoboehmite into ?-alumina and ?-alumina, respectively. UV-vis, SEM and TEM analysis confirmed that gold nanoparticles were successfully distributed homogeneously and stabilized at all temperatures. The resulting size after heat treatments was 12.9 nm ± 2.32 nm (100 °C), 13.8 nm ± 2.76 nm (500 °C) and 13.1 nm ± 3.27 nm (1000 °C). FTIR and Raman spectroscopy present an analysis of the vibrational modes of citrate when it is adsorbed on pseudoboehmite. Finally, Raman spectra showed that gold nanoparticles prevent the analysis of the vibrational modes of pseudoboehmite to make this materials suitable for SERS applications.

Keywords: Gold nanoparticles, pseudoboehmite, SERS

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