Synthesis and characterization of gold nanoparticles supported on two different metal oxides prepared by impregnation with ionic exchange to form ferromagnetic nanostructures

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Abstract: Nano-sized materials have particularly attracted attention due to their thermal, electrical, magnetic and optical properties that differ substantially from those of the corresponding solid material. In this work, we study gold nanoparticles supported on titanium oxide and cerium oxide, prepared by impregnation with ionic exchange. In the first stage, the conditions of fixing of the gold precursor on the oxide support are optimized. In the second stage, the samples are calcined at temperature (T=250 °C). Several experimental techniques are used for the characterization of the samples at the various stages of their elaboration (MEB, DRX…). A change of morphology of the oxides supports grains was observed by Scanning Electron Microscope. The X-rays diffraction made it possible to evidence the formations of nanoparticles of gold sized 3 nm in the case of catalysts Au/TiO2 calcined at 250°C, and the formation of nanoparticles Au51Ce14 of near size 7 nm in the case of Au/CeO2 calcined at 250°C. At superior temperature, its size increases following the phenomenon of coalescence.

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