

Iron Oxide Nanoparticles Synthesis Using Fast Polymer Precursor Based Method

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Metal oxide nanoparticles have been raising interest due to their possible applications in electronic and magnetic devices. In this work, iron oxide (Fe_2O_3) nanoparticles were synthesized using a polymeric precursor based method. This method is based on the complexation of iron cations and polyacrylate in an aqueous media, resulting in a chelation product that, when calcined, leads to the formation of nanoparticles of the metal oxide^[1]. The calcination temperatures were determined using Differential Scanning Calorimetry (DSC), them being 400°C, 450°C, 500°C and 550°C. The decomposition process of the polyacrilate and the formation of iron oxide were studied using Fourier-Transform Infra-Red Spectroscopy (FTIR). X-Ray Diffraction (XRD) using Scherrer inference indicated the presence of nanoparticles under 50nm. Scanning Electron Microscopy was also employed to study the morphology of the particles. This process enables the synthesis of nanoparticles faster than conventional polymeric precursor methods.

[1] R. Foster, C. Mendes, R. Kiminami, *Advanced Powder Technology*. **27**, (2016) 1056-1061