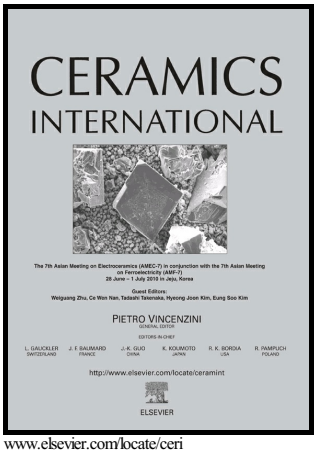

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Maghemite, γ-Fe_2O_3, nanoparticles preparation via carbon-templated solution combustion synthesis

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Abstract

High surface area maghemite, γ-Fe_2O_3, nanoparticles were prepared via carbon-templated solution combustion synthesis, which is a two-step approach. Step one involves the combustion synthesis of maghemite nanoparticles embedded in an amorphous carbon matrix, by using a fuel rich reaction mixture of triethylenetetramine and iron nitrate. Step two consists of residual carbon removal by treating the previously-obtained composite precursor with hydrogen peroxide, which releases the maghemite nanopowder. This approach avoids carbon removal by thermal treatment, thus preserving the nanometric size of maghemite nanoparticles (8 to 12 nm), yielding a high specific surface area of 191.9 m^2/g. At the same time, the final maghemite nanoparticles presented a superparamagnetic behavior and a saturation magnetization of 26.2 emu/g, in relation to the small particle size.