

POROUS NANOSTRUCTURE OF HEMATITE AND MAGNETITE

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The synergy of magnetic properties and exceptional characteristics of materials with large surface-to-volume ratio opens new possibilities for specific applications. Herein we report the synthesis of two phase nanoporous structures of α - and γ - Fe_2O_3 phases. Hematite is widely used in catalysis, photo-catalysis and sensors but the magnetic properties of hematite are unsatisfactory as it is a canted antiferromagnet with a very low saturation magnetization. In turn maghemite has a relatively low adsorption capability but displays relatively large magnetization and can be applied to magnetic separation in diverse applications. Synthesis of nanoporous materials composed of maghemite and hematite phases can thus lead to a material which combines good magnetic properties with high ability for adsorption, catalysis and photocatalysis that may find diverse applications in biomedicine, biotechnology and water treatment. In this work the microstructure and magnetic properties of hematite-magnetite composites will be presented and discussed in the context of synthesis method and post-preparation treatment.

9.7 cm

13.4 cm

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