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Systematic study of using iron oxide bearing sintering wastes for hard and soft ferrimagnetic glass ceramics preparation

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About 25% of iron oxides in the sintering process are wasted. In this paper sintering waste (SW) were used as raw materials for hard and soft magnetic glass ceramics (H-, SMGC). About 71% by wt. of SW was used for preparing SMGC, while ~46% was used for HMGC preparation, Differential thermal analysis revealed one broad exothermic peak at 830˚C for HMGC and at 803˚C for SMGC. X-ray diffraction shows crystallization of hematite and Zn-ferrite phases in SW and Zn-ferrite and Ba hexaferrite in SMGC and HMGC respectively. Transmission electron microscope revealed crystallization of nanosize particles > 20 nm for SMGC and < 15nm for HMGC. Vibrating scanning magnetometer revealed increasing in saturation magnetization from ~26 emu/g for SW to ~44 emu/g for SMGC and decreased to ~12 emu/g for HMGC.

Biography

Nehal Ali Erfan Abdelwahab has completed her Master's degree in Chemical Engineering at Minia University, Egypt. She spent two years working for her PhD in the National Research Center in Cairo and now is completing her PhD study in Biomedical Engineering at East Carolina University, Greenville, USA.

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