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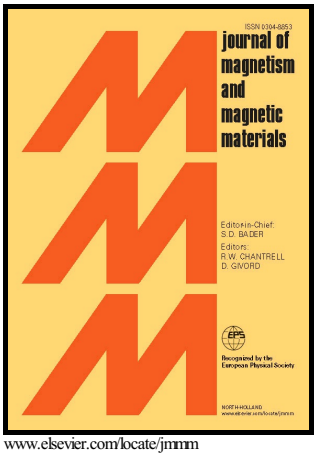


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# Preparation and magnetic properties of the Sr-hexaferrite with foam structure

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## Abstract

This work reports an optimal way to fabricate strontium hexaferrite with porous-reticulated structure using a variation of the replication technique and taking two different precursors, one obtained from the coprecipitation and the other from the ceramic method. Changes made to the original replication technique include the addition of Arabic gum as binder, and the addition of ethylene glycol to form the ceramic sludge. In addition, some parameters such as the relation between solid material and liquid phase, the quantity of binder and the heat treatment were varied to obtain high quality magnetic foams. Two polymeric sponges were used as patterns, one with average pore size of 300 μm diameter and the other with 1100 μm. The characterization of the samples included the analysis of the structure and phase purity, the magnetic properties, the remanence properties, magnetic interactions and the microstructural characteristics. Results indicate that both, the powder precursors and the polymeric pattern play an important role in the configuration of the foam structure and this configuration has an important influence on the dipolar interactions which tend to demagnetize the samples. In addition, it was analyzed the behavior between the minimum value of the $\delta M$ curves and the hysteresis properties.

**Keywords:** Henkel plot; magnetic interactions; magnetic ceramic foam; porous hexaferrite.

## 1. Introduction

Technological advances demand novel materials capable of taking on the challenge of the emerging applications [1]. In this sense, the understanding, design, and manipulation of pore-structures have significant influence on the development of science, and actually are playing increasingly important roles in progress of technology [2]. The large surface area,

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