

Neodymium ions activated barium ferrite composites for microwave X-band absorber applications: Synthesis and characterizations

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Abstract	Some composites of barium ferrites activated with the neodymium ions (Nd ³⁺) of composition (20)BaO:(80-x)gamma-Fe ₂ O ₃ :(x)Nd ₂ O ₃ (x = 0, 1 and 2 mol%) were synthesized using the modified mechanical alloying for the first time. The influence of varying Nd ³⁺ concentrations on the morphologies, microstructures, and magnetic characteristics of these composites were evaluated. In addition, the microwave (MW) reflection loss, complex relative permittivity, and permeability of the studied composites in the frequency range of 8.2-12.4 GHz were analysed using the Nicholson-Ross-Weir (NRW) method. The inclusion of Nd ³⁺ in the proposed composites was discerned to influence the permittivity, permeability and reflection loss significantly in the MW X-band region.
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