

Yttrium iron garnet ceramic prepared from microwave-induced combustion powders

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Yttrium iron garnet (YIG) nano-powders were successfully synthesized by microwave-induced combustion process. The process takes only a few minutes to obtain as-received yttrium iron garnet nano-powders. The resultant powders annealed at different temperature and were investigated by X-ray diffractometer (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), vibrating sample magnetometer (VSM), differential thermal analyzer (DTA) / thermogravimeter (TG). The as-received product shows the formation of garnet structure with saturation magnetization (M_s) of 12 emu/g, whereas upon annealing at 825 ° for 2 h, the saturation magnetization increases to 27 emu/g. The as-received yttrium iron garnet powders annealed at several temperatures revealed that the particle size ranged from 65 to 90 nm. Moreover, the linewidth of magnetic resonance peak, initial permeability, and coercive force (H_c) of YIG ceramic are also examined in this study.

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