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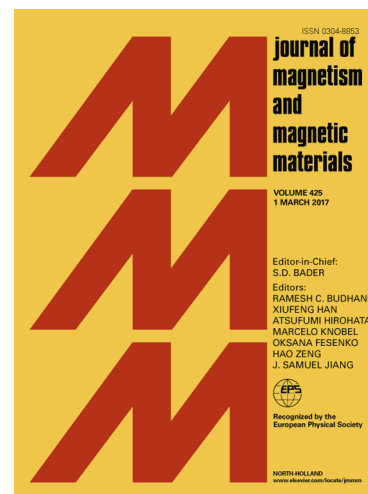
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Tunable maximum energy product in CoFe_2O_4 nanopowder for permanent magnet application

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Abstract:

In this study, we report the behavior of maximum energy product $(BH)_{\max}$ of cobalt ferrite nanopowder towards the variation of calcinations temperature. The studied CoFe_2O_4 nanopowder was synthesized using sol-gel autocombustion method. X-ray diffraction, scanning electron microscopy, Mössbauer spectroscopy and superconducting quantum interference device magnetometer techniques were used to characterize crystal structure, phase composition, morphology and magnetic properties. By changing the calcination temperature ($T = 600^\circ\text{C}$, 800°C , 1000°C and 1100°C), the structural and magnetic properties of the compounds could be tuned. The magnetic properties results show that the highest value of $(BH)_{\max}$ is close to 0.35 MGOe observed for the sample calcined at $T = 800^\circ\text{C}$. These results suggest that $(BH)_{\max}$ of cobalt ferrite nanopowder can be enhanced by optimizing synthesis steps.

Keyword : Ferrites , Permanent magnet, Magnetic properties, $(BH)_{\max}$.

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