Perhitungan nilai magnetisasi remanen, koersivitas, dan konstanta anisotropi barium hexaferrite yang disubstitusi Mn/Ti menggunakan model heisenberg = Calculation of remanence magnetization coersivity and anisotropy constant for barium hexaferrite doped Mn/Ti using heisenberg model

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Abstrak

Model BaFe12O19 telah dikembangkan menggunakan pendekatan Mean Field pada Hamiltonian Heisenberg. Parameter exchange interaction dihitung dengan memanfaatkan informasi posisi-posisi Fe3+ dan nilai suhu Curie Barium hexaferrite. Model ini memberikan nilai magnetisasi saturasi sebesar 79 emu/gram dan koersivitas 0.7 Tesla untuk BaFe12O19 pada suhu kamar. BaFe12􀀀xMnxO19 (x=0,1,2,4), BaFe12􀀀xTixO19 (x=0,1,2), BaFe12􀀀2xMnxTixO19 (x=0,1,2) mengalami penurunan nilai magnetisasi saturasi, remanen, dan koersivitas seiring meningkatnya konsentrasi Mn/Ti.

<hr>A model of BaFe12O19 has been developed based on Heisenberg Hamiltonian within Mean Field approximation. The exchange interaction parameter was calculated using the information of Curie temperature and positions of Fe3+ ions in Barium hexaferrite. This model at room temperature gives a saturation magnetization value about 79 emu/gram and coercivity about 0.7 Tesla for BaFe12O19. BaFe12􀀀xMnxO19 (x=0,1,2,4), BaFe12􀀀xTixO19 (x=0,1,2), BaFe12􀀀2xMnxTixO19 (x=0,1,2) show a decreasing trend in saturation magnetization, remanence, and coercivity with increasing x value.