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Ferroelectric and ferromagnetic properties of Ga_x $CoFe_{2-x}O_4$ /$BaTiO_3$ YAN NI, Department of Electrical and Computer Engineering, Iowa State University, Iowa, Ames, USA, CAJETAN NLEBEDIM, Ames Laboratory, US DOE, Iowa State University, DAVID JILES, Department of Electrical and Computer engineering, Iowa State University, Iowa, Ames, USA — Single phase magnetoelectric materials are limited in application. Consequently, practical application of magnetoelectric materials requires the development of composite materials in which piezoelectric and magnetostrictive phases are coupled via interfacial strain. In addition to strong coupling, it is desirable that both the magnetostrictive and piezoelectric phases possess high sensitivity, $d\lambda/dH$ and $dP/d\sigma$ respectively. Of all the substituted cobalt ferrite studies, CoGaxFe2-xO4 has been shown to have the highest strain sensitivity. In the present study, CoGaxFe2-xO4 (x=0.1, 0.2, 0.3) has been combined with BaTiO3 to fabricate a y(CoGaxFe2-xO4)-(1-y)BaTiO3 (y = 0.4, 0.5 and 0.6) magnetoelectric composite samples. Crystal structure, microstructure and compositions of the samples were verified by XRD, SEM and EDX. The effect of the BaTiO3 phase on the magnetostrictive properties of CoGaxFe2-xO4 and the effect of the CoGaxFe2-xO4 phase on the piezoelectric properties of BaTiO3 will be presented with respect to the magnetoelectric properties of the composites.

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