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Fabrication of Barium Ferrite Thick Films[1] WEI JIANG YEH, CARLA BLENGERI-OYARCE, SUNDEEP PILLAMARI, JNANA MANOJ APPIKONDA, LAURA DIAZ, YANKO KRANOV, DAVID MCILROY, University of Idaho — During recent years the need for high quality self-biased barium ferrite ($BaFe_{12}O_{19}$) thick films had been increasing due to its chemical stability, anisotropy and oriented hexagonal M-type ferrites. Our goal is to fabricate barium ferrite thick films to be incorporated in self-biased microwave devises. Different methods such as sputtering, pulse laser deposition, CVD and modified liquid phase deposition have been used for thick film deposition with limited or no success for thickness above 300μm. Excessive residual stresses of BaM films deposited with the previous methods and/or their low coercivity are the main problems targeted by this project. We present a low cost solution using $BaFe_{12}O_{19}$ nanopowder mixing with epoxy. The mix is placed on alumina substrates to fabricate 500μm thick films of BaM, resulting thick films with good magnetic properties such as a 4πMs between 2.000 to 2.500 Gauss and a coercivity of 3800 to 4000 Oe. In addition, we have integrated the barium ferrite thick films into microwave devises and successfully deposited their contact lines for their testing and use.

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