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Stability of Multiferroic Transition in $FeVO_4$ against Transition Metal Doping AKILA KUMARASIRI, Wayne State University, Detroit, MI, AMBESH DIXIT, Indian Institute of Technology, Rajasthan, India, GAVIN LAWES, Wayne State University, Detroit, MI — $FeVO_4$ is a recently discovered multiferroic material which undergoes successive antiferromagnetic phase transitions at $T_{N1} \sim 22$ K and $T_{N2} \sim 15$ K, with ferroelectricity developing at the T_{N2} transition. $FeVO_4$ is a type II multiferroic where the ferroelectricity is magnetically driven. We have studied the effect of transition metal doping on these two phase transitions in order to explore how the multiferroic order is affected by introducing perturbations into the lattice. We synthesized polycrystalline $M_xFe_{1-x}VO_4$ samples (M = Zn, Mn, Cr) using a standard solid state reaction method, and we used magnetic, dielectric, and heat capacity measurements to track the transition temperatures. Both magnetic and heat capacity measurements show clear peaks at the two transitions, enabling us to map how the transitions are suppressed as the doping fraction is changed. On doping with non magnetic Zn, we find only a minimal suppression of both transition temperatures, indicating the magnetic interactions producing the multiferroic order are surprisingly robust against non-magnetic perturbations. We will also present preliminary results of the effects of magnetic dopants, specifically Mn and Cr.

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