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Study of the electric and magnetic properties of FeVO_4 and iron oxide nanoparticle composites EHAB ABDELHAMID, SUVRA LAHA, GAVIN LAWES, Wayne State University, GAVIN LAWES RESEARCH GROUP TEAM — FeVO_4 is a multiferroic material that exhibits antiferromagnetic phase transitions near 15 K and 22 K in bulk. It was found that magnetically driven ferroelectricity develops at the lower temperature transition. In order to explore the possibility of increasing the coupling of antiferromagnetic FeVO_4 to an applied magnetic field along with possible exchange bias effects, we study the ferroelectric and ferromagnetic properties of FeVO_4 and iron oxide nanoparticle composites. The nanoparticles were prepared in a single chemical co-precipitation reaction and then sintered. We used X-ray diffraction and electron microscopy to characterize the structure and morphology of the nanoparticles. We investigated the magnetic and ferroelectric properties, including the magnetoelectric coupling, using temperature and field dependent magnetic and dielectric measurements.

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