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Magnetic and Raman spectroscopic studies of yttrium substituted BiFeO₃ R. NAIK, S. TALEBI, AMBESH DIXIT, Wayne State University, V. NAIK, University of Michigan, Dearborn, G. LAWES, Wayne State University — As a room temperature multiferroic BiFeO₃ is attractive for a number of applications. However the relatively weak magnetism limits its suitability for applications. Bi_{1-x}Y_xFeO₃ (x=0, 0.05, 0.10, 0.15 and 0.20) ceramic samples have been prepared by sol-gel technique and thin films by metalorganic decomposition. X-ray diffraction, X-ray photoelectron and Raman spectroscopy measurements confirm that these ceramic and thin film samples are of single phase. More remarkably these Y modified BiFeO₃ samples exhibit enhanced room temperature magnetic and magnetodielectric properties, with the saturation magnetization approaching 25 emu cm⁻³ for x=0.20. We discuss the correlation between the enhanced room temperature magnetization and two-phonon Raman modes in the context of investigating the origin of the magnetic properties in Bi_{1-x}Y_xFeO₃.

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