Physical properties of polar magnetic oxide $HoFeWO_6$

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Polar magnetic oxides are interesting systems to study due to the possibility of hosting functional properties such as ferroelectricity, piezoelectricity etc. In this work, a new compound $HoFeWO_6$ is synthesized using high temperature solid state reaction and characterized using x-ray diffraction, neutron diffraction, magnetization measurements and dielectric measurements. The x-ray and neutron diffraction results indicate that $HoFeWO_6$ crystallizes in polar (non-centrosymmetric and achiral) orthorhombic structure *P n a* 21. The magnetization measurements indicate that $HoFeWO_6$ exhibit paramagnetic to antiferromagnetic transition at T_N = 18 K. The dielectric properties at room temperature indicate that the dielectric constant decreases with increase in frequency indicating the low frequency dielectric behavior is dominated by the external effects such as interface polarization.