
Synopsis Seminar

Seminar Title	: Tunable Magnetic, Electrical and Optical Properties of Doped KBiFe ₂ O ₅ for Environmental Applications
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Venue	: Seminar Room (MC-126), Dept. of Physics and Astronomy
Date and Time	: 25 Jun 2025 (11:00 AM)
Abstract	: The development of semiconductor industry has been sustained due to the invention of new multifunctional materials like brownmillerites owing to their versatility and potentiality to improve the lives of mankind. Magnetic ordering and lower band gap of brownmillerites plays an important role for their diversified practical applications viz. photocatalyst, solar cells, magneto-optic devices, optoelectronics and for organic dye degradation etc. However, the modification of magnetic phase, electrical property and the electronic structure are much needed for the efficient applicability. Transition metal ion and rare earth ion substitution is one of the desirable approaches in this regard, which really opens a new avenue for the researchers to tune the physical properties of the material. In this endeavour, this thesis work focuses on the brownmillerite structured material as it possesses low band gap, interesting magnetic property and improved electron transport properties as compared to other brownmillerites. In this context, a series of (N ²⁺ and Dy ³⁺) doped KBiFe ₂ O ₅ have been prepared by solid state method. The phase purity, structure, morphologies are characterized by XRD, SEM techniques. Magnetic and electrical properties of the materials are thoroughly studied using VSM and Impedance spectroscopy. Optical properties are investigated by UV/Vis spectroscopy.