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## *Aurvillius oxide introduction, materials characterization: literature review*

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## **Abstract:**

The synthesis of Aurivillius phase layered bismuth titanate ( $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ , BTO) thin films on FTO glass substrates via sol-gel spin coating technique and their potential for detecting mercury ( $\text{Hg}^{2+}$ ) and lead ( $\text{Pb}^{2+}$ ) ions are investigated. XRD analysis indicates predominant crystal growth along the (117) plane, indicative of the orthorhombic structure of BTO. SEM images reveal an anisotropic plate-like morphology. Photoluminescence The thickness of the deposited film is influenced by the viscosity of the coating solution and the rotational speed during the spin-coating process. By adjusting cence spectra exhibit a prominent optical emission peak at 545 nm, with observed phonon modes consistent with the orthorhombic phase of BTO thin films. Electrochemical studies demonstrate the high electrochemical activity of the fabricated thin film electrode in detecting mercury ( $\text{Hg}^{2+}$ ) and lead ( $\text{Pb}^{2+}$ ) ions, boasting enhanced sensitivity and low detection limits.