Title:	Investigation on the Flux Synthesis of Double Layered Sillen-Aurivillius Perovskite Oxyhalide Sr2Bi3Ta2O11Cl and their Photocatalytic Properties
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Abstract:	Developing a heterogeneous photocatalyst in relatively less harsh condition, which is also cost effective and at the same time has many advantages, is very challenging but here in we, for the first time, developed a very promising double layered perovskite oxyhalide Sr 2 Bi 3 Ta 2 O 11 Cl, a nanoplate of width 800 nm, surface area 3.746 m 2 /g and band gap 2.68 eV using flux method. Dyes, which are the main untreated discharged pollutant from different textile industries, plays huge role in water pollution. The synthesized oxyhalide Sr 2 Bi 3 Ta 2 O 11 Cl was used for adsorption of Congo Red dye to treat waste water with maximum adsorption capacity of 18.4 mg/g, which is much better than many other adsorbents. Kinetic studies shows that reaction is following pseudo first order kinetics and Langmuir isotherm model. Deethylation of Rhodamine B (RB) to Rhodamine 110 (R110) is also been studied in this project using the synthesized catalyst, since commercial production of R110 is very challenging because of formation of various side products hence leading to high purification cost and less yield of product. We used Sr 2 Bi 3 Ta 2 O 11 Cl nanoplates as a photocatalyst for the stepwise conversion of RB to R110 under unlimited solar light and obtained 54% yield in the first cycle itself which interestingly was increasing with reusing catalyst in further cycles to produce 99% yield of R110 in 11 th cycle. Product formation was confirmed using different spectroscopy and other techniques and mechanism of this conversion is also demonstrated.
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