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| Title:                  | Synthesis of Mixed Oxide Sillen Aurivillius Phase for Photocatalytic and Piezocatalytic Chemical Transformations  |
| Authors:                | <a href="#">Kaur, Jaspreet</a>  |
| Keywords:               | Mixed Oxide<br>Aurivillius Phase<br>Photocatalytic<br>Piezocatalytic  |
| Issue Date:             | Apr-2022  |
| Publisher:              | IISER Mohali  |
| Abstract:               | Recently, bismuth oxyhalides have been shown to be a potential candidate for photocatalysis along with their unique valence band structures. In this project, the effect of synthesis temperature of Bi 4 NbO 8 Cl on the band gap and its photocatalytic activity has been investigated. Rh110 is an important fluorophore for various medical and industrial applications and as this dye is very expensive, it is important to find a synthetic route that is simple and having high yield of Rh110. In this project we have checked the photocatalytic conversion of RhB to Rh110 and the effect of synthesis temperature on this conversion. It has been found that the yield of Rh110 from RhB increased with the increase in the synthesis temperature, i.e., for synthesis temperature of 700 o C and 900 o C it was calculated to be 30% and 61% respectively. These materials, i.e., bismuth oxyhalides are also known to show the ferroelectric behaviour but they have not been much exploited in the field of piezocatalysis which is further an application of material's piezoelectric behaviour. Thus, the piezocatalytic RhB degradation was investigated for Bi 4 TaO 8 Cl synthesised at 700 o C. It was found to show an excellent piezocatalytic activity where the pseudo-first order rate constant for RhB degradation was found to be 0.10557 min <sup>-1</sup> . The effect of power, frequency, dye concentration, amount of catalyst used has also been investigated in this work. Also, the scavenging experiments was performed for finding the reactive oxygen species that is mainly responsible for carrying out the RhB degradation. |
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