

Synthesis of Bismuth Sulfuriodide For Water Splitting

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Developing clean and efficient new energies has been one of the main challenges in the last few decades. Using solar energy to produce hydrogen by water splitting is considered as one of the viable approach to generate and store renewable energy. Bismuth based chalcogenides are potential candidate materials showing photoconductivity to be used as photoabsorber for water splitting.

In this research BiSI was synthesized via mild heating (200 °C) of Bi-oxyhalides under H₂S gas [1]. BiOI was grown on the electrode by electrochemical method using *p*-benzoquinone [2]. BiSI has a bandgap of 1.5 eV and is shown to be an n-type material which can be used as a photoanode for water oxidation. The resulting BiOI electrodes showed decent photoelectrochemical performance for sulfite oxidation onset at 0.3 V vs. RHE in 0.1 M sodium sulfite electrolyte under 1 sun illumination.

[1] Kunioku, H., Higashi, M., & Abe, R. (2016). *Scientific Reports*, 6, 32664.

[2] McDonald, K. J., & Choi, K. S. (2012). *Energy and Environmental Science*, 5(9), 8553-8557.