***Abstract ID: P39***

# OPTIMIZING THE SUCCESSIVE IONIC LAYER ABSORPTION AND REACTION CYCLES OF BISMUTH OXYIODIDE FOR SENSITIZED SOLAR CELLS

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## Abstract

Dye – sensitized solar cells (DSSCs) are the third-generation low-cost solar cells. Photoanode, electrolyte and counter electrodes are the main components of a dye-sensitized solar cells. Generally, commercially available inorganic dyes are used as the sensitizers in dye-sensitized solar cells. Overall performance of the dye-sensitized solar cell can be enhanced by modifying these components. In DSSC, commercially available dyes are generally used. They show a better performance. But they are the expensive materials. In this study, Bismuth Oxyiodide (BiOI) has been synthesized on $TiO_2$ nanostructure by successive ionic layer adsorption and reaction (SILAR) technique. In order to fabricate highly efficient solar cell, number of SILAR cycles were optimized and compared with the N719 dye – sensitized solar cells under the same conditions. Fabricated BiOI - sensitized solar cell shows a maximum efficiency of 0.54% while the N719 dye-sensitized solar cell shows an efficiency of 3.33% under the illumination of 100 mW $cm^{-2}$ with AM 1.5 spectral filter. However, BiOI can be used as a low-cost sensitizer for dye-sensitized solar cells.

**Keywords:** *bismuth oxyiodide, successive ionic layer adsorption and reaction (SILAR), dye – sensitized solar cell*