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## Synthesis of nanostructures: Hetero structures for energy storage application

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The earth abundant materials that can be used in solar water splitting cells remain an important goal for environmentally challenging methods for energy conversion and storage. Recently many researchers have put potential efforts to develop efficient photo electrodes depending on the shape and size of micro and nano scale features of semiconductors. The semiconductor based generation of water splitting using solar irradiation has attracted great attention since the first report of photo electro chemical (PEC) water splitting was published by Honda and Fujishima in 1972. To achieve best efficiency of solar water splitting, the PEC cell must perform multiple functions like light harvesting, semiconductor/electrolyte interfaces charge transfer and chemical redox reactions. In addition to that, the effective light scattering is dependent on the nanostructure semiconducting materials and efficient charge separation depends on the formation of hetero junction in between the two semiconducting materials. The present study focuses on how the nanostructured photo anode and hetero junction photo anode are familiar for energy storage application. In addition to that the surface modification of photo anode is also very important criteria for enhancing the efficiency of photo electro chemical (PEC) water splitting. The development of particular nanostructured hetero junction photo anodes material which absorbs visible light efficiently, durably and scalably is a challenging task.

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