**Link:** <https://solar-power-tech.com/e-posters/sfs_eposter_10/>

**Abstract**

Hematite (α-Fe2O3), an emerging and promising metal oxide photoelectrode that bears several shortcomings, can be resolved by performing nanostructuring, doping and usage of photosynthetic pigments [1, 2]. The present work focuses on implementing this idea, where a novel, one-pot chemistry route is applied, where we treat iron chloride in oleic acid, in the presence of precipitating agent urea, responsible for the breakdown of nano octahedrons formed at high temperature [3]. The cauliflower turf nanostructure obtained because of the same displays the highest photocurrent density of 50 μA/cm2 at AM 1G. Simultaneously, the photosynthetic pigments have been extracted and isolated from the naturally available, cheap sources such as vegetable, flowers, and fruits. In the later part of the work, the pigment was adsorbed onto the prepared hematite photoanode on FTO. These pigments coated hematite biophotoelectrode displays enhanced photocurrent density meanwhile also removing the cathodic transient spike in the case of β- Carotene and betanin, whereas both anodic and cathodic transient spike on Chlorophyll and Anthocyanin coating [4]. Therefore, using these cheap pigments and nanostructure hematite films could be the subsequent design of a biophotoelectrode