
Contribution ID: **300** Type: **Poster Presentation**

# Synthesis and Characterization of α-Fe2O3 nanorods arrays for Hydrogen Production

*Thursday, 11 July 2019 15:00 (2 hours)*

Since the discovery of Iron Oxide, several phases of it have been realized. A thermodynamic stable phase of Iron Oxide from a natural occurring water photo oxidation. This work seeks to enhance the band gap and the conduction edge to the required values in order to attain this phase akaganiete (β-FeOOH) is hematite (α-Fe2O3) and it has attracted much attention because of its great advantages, such as thermal stability, Photo-corrosive resistance and Photo-catalytic. The major advantage of hematite is its ability to form a 1-D type nanorods structure via self-assembly mechanism. This type of nanostructure has a better electrical transport property and a band gap of 2.2 eV. Therefore, due to these properties it is a promising candidate for water splitting application. This work focuses on nanorods of hematite for hydrogen production by splitting of water but the setback is the fact that the band gap of these rods is limiting the application of it in water splitting. This is due to the fact that water splitting requires a band gap of 2.46 eV with and without external bias. Therefore, a blue shift of 0.3 to 0.6 eV on the band gap and simultaneous upward shift on the conduction edge would make hematite a good candidate.

## Apply to be<br> considered for a student <br>   award (Yes / No)?

no

## Level for award<br> (Hons, MSc, <br>   PhD, N/A)?

n/a

**Primary author:** Dr NDLANGAMANDLA, Cebo (University of Zululand)

**Presenter:** Dr NDLANGAMANDLA, Cebo (University of Zululand)

**Session Classification:** Poster Session 2

**Track Classification:** Track A - Physics of Condensed Matter and Materials