

Supporting Information

**Humic acid as sensitizer in highly stable dye solar
cell : Energy from abundant natural polymer soil
component**

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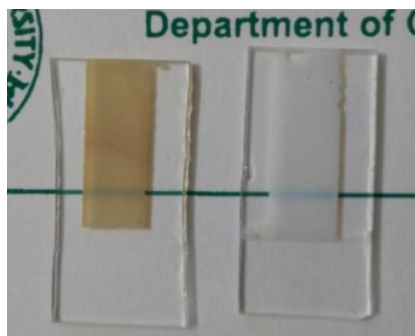


Figure S1. TiO₂ photoanode with and without HA

Dye adsorption - desorption study:

A stock solution of 0.4 % (w/v) HA was prepared in DMSO:DMF and diluted to 0.16 % (w/v) for dye adsorption on FTO/TiO₂ electrode having area 1.0 cm². Dye bath containing FTO/TiO₂ was kept at 40 °C for 48 hrs and sensitized photoanode was washed thoroughly with DMSO:DMF solvent mixture followed by drying.

For desorption process, pre-sensitized FTO/TiO₂ electrode was kept in 0.001M aqueous NaOH solution for 24 hrs. Amount of dye loading was determined by measuring absorbance in UV-Vis spectra (**Figure S2**) before and after desorption using calibration curve method. Calculation shows that, 0.02% (w/v) of HA was adsorbed on 1 cm² titania electrode from 0.16% (w/v) HA solution.

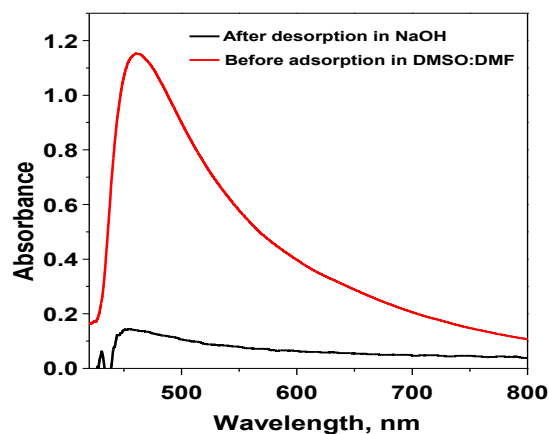


Figure S2. UV-Vis spectra of HA solutions

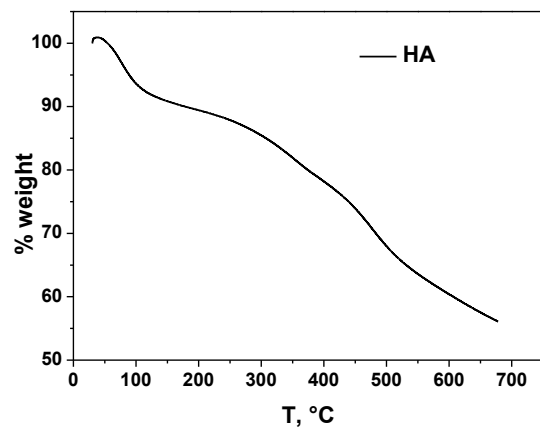


Figure S3. TGA characteristic of HA