Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting Information

Fabrication of high efficiency PET polymer based flexible dye sensitized solar cells and tapes through heat sink supported thermal sintering of bilayer TiO_2 photoanodes

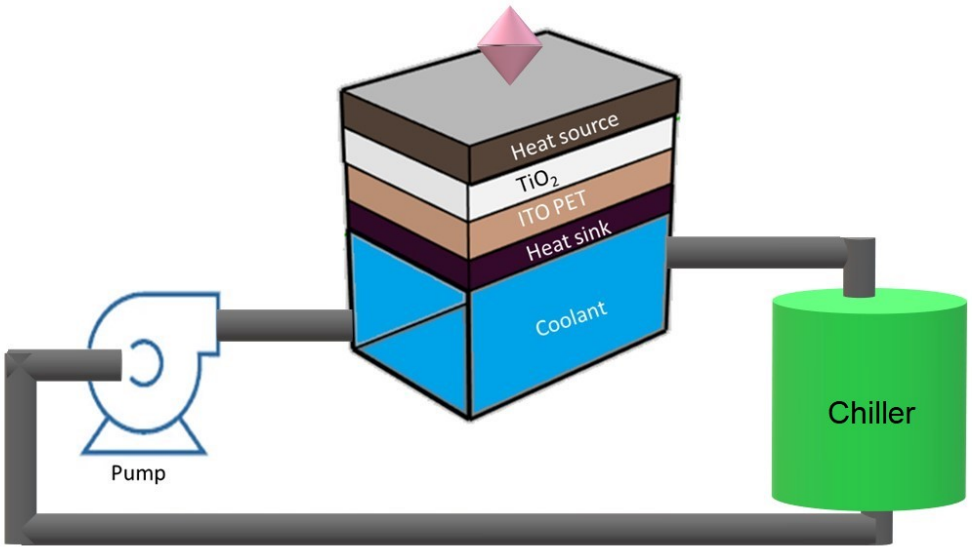
B. Murali[a], K. Gireesh Baiju[a,b], R. Krishna Prasad[a,b], K. Jayanarayanan[a,b], Duraisamy Kumaresan[a,b,*]

a. *Centre of Excellence in Advanced Materials and Green Technologies, Amrita School of Engineering, Coimbatore 641112, Amrita Vishwa Vidyapeetham, India*

b. Department of Chemical Engineering and Materials Science, Amrita School of Engineering, Coimbatore, Amrita Vishwa Vidyapeetham, India

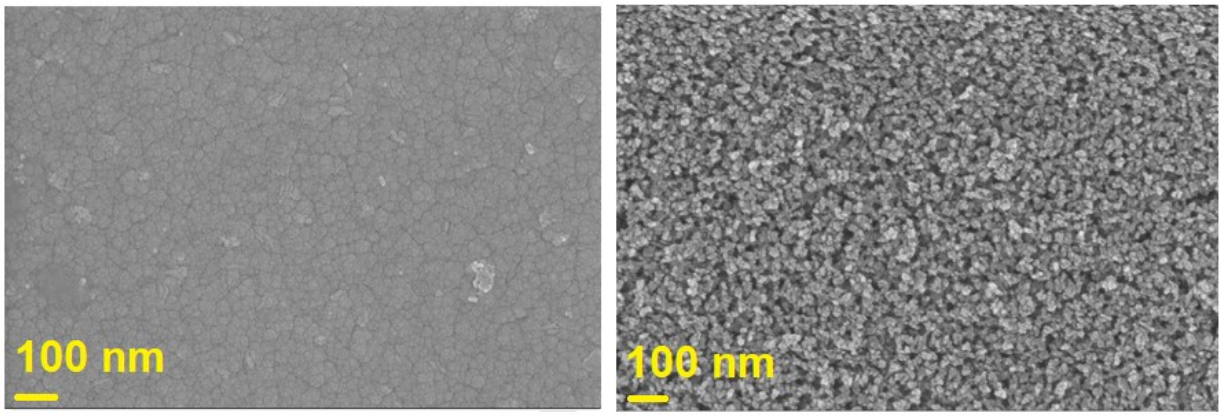
* E-mail: rdkumares@gmail.com, k_duraisamy@cb.amrita.edu, *Tel: +91-422-2685000.*

S1: Compression press hot plate + heat sink + chiller characteristics



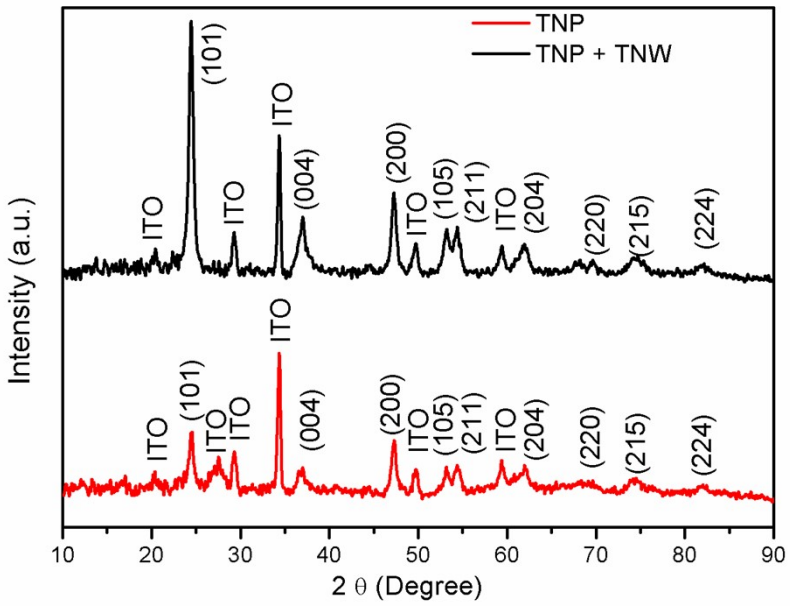
A 1:1 v/v mixture of water and ethylene glycol is used as coolant for the circulation between chiller and heat sink, which produces the lowest surface temperature of heat sink about -14 °C. From the plate fin heat sink channel width and length, coolant density and velocity Reynolds number (Re) calculated is 236 and modified channel Reynolds number (Re_b) is 4.

S2: SEM images of ITO PET (left image) and TiO_2 nanoparticles coated ITO PET (right image) sintered at 250 °C

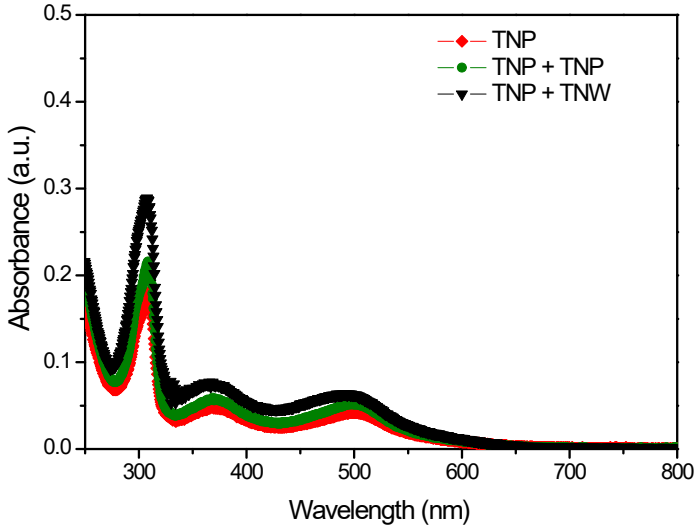


S3. Image of 0.5 x 0.5 cm^2 TiO_2 mono layer coated ITO PET sintered at 250 °C and bent up to 1 cm radius during bending test

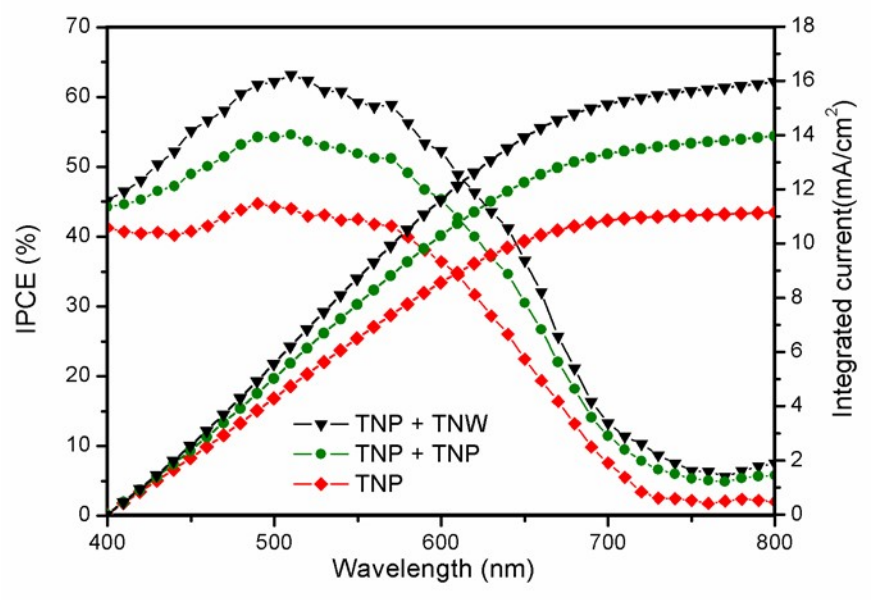
S4. XRD patterns of TNP monolayer and TNP+TNW bilayer coated ITO glass substrates sintered at 250 °C



S5. UV-visible absorption spectra of dye desorbed from TNP, TNP+TNW, and TNP+TNP based FDSSC photoanodes

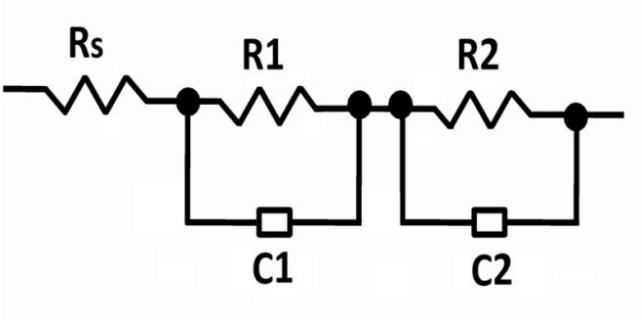


S6. Integrated J_{sc} calculated based on the IPCE curves of mono and bilayer TiO_2 photoanodes based FDSSCs.

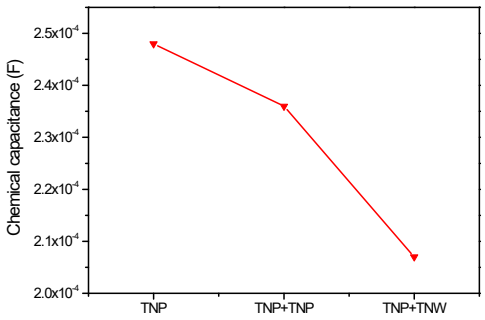


S7. Electrochemical impedance parameters calculation of photoanodes using the equivalent circuit and their comparison

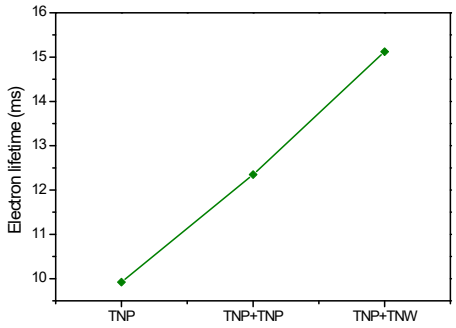
EIS parameters of FDSSCs of mono and bilayer photoanodes obtained from the Nyquist plots recorded at -0.75 V applied bias potential and fitted with an equivalent circuit.



Chemical capacitance



Electron lifetime



Charge transfer resistance