Supporting Information (SI)

Phase Controlled Synthesis of Bifunctional TiO_2 Nanocrystallites via D-mannitol for Dye-Sensitized Solar Cells and Heterogeneous Catalysis

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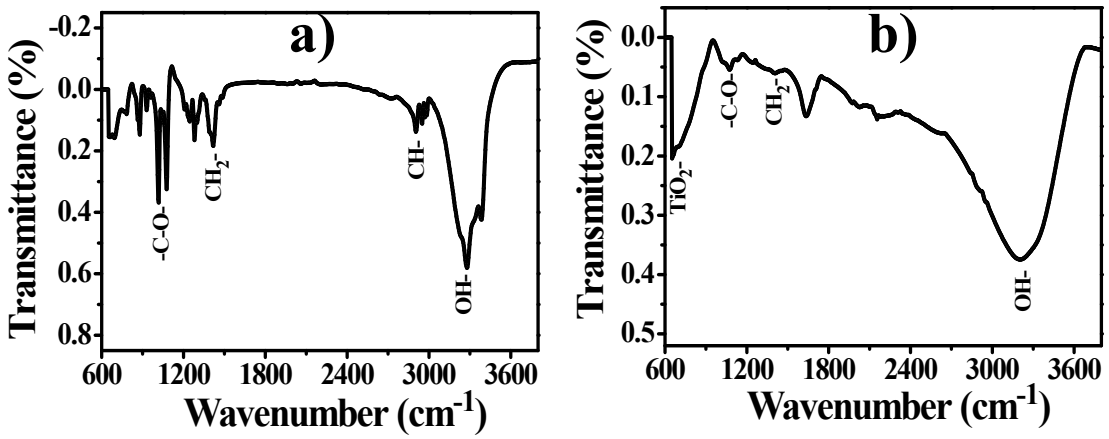


Fig. S1 FTIR spectra of; a) pure D-mannitol, and b) an intermediate complex of TiO_2–D-mannitol.

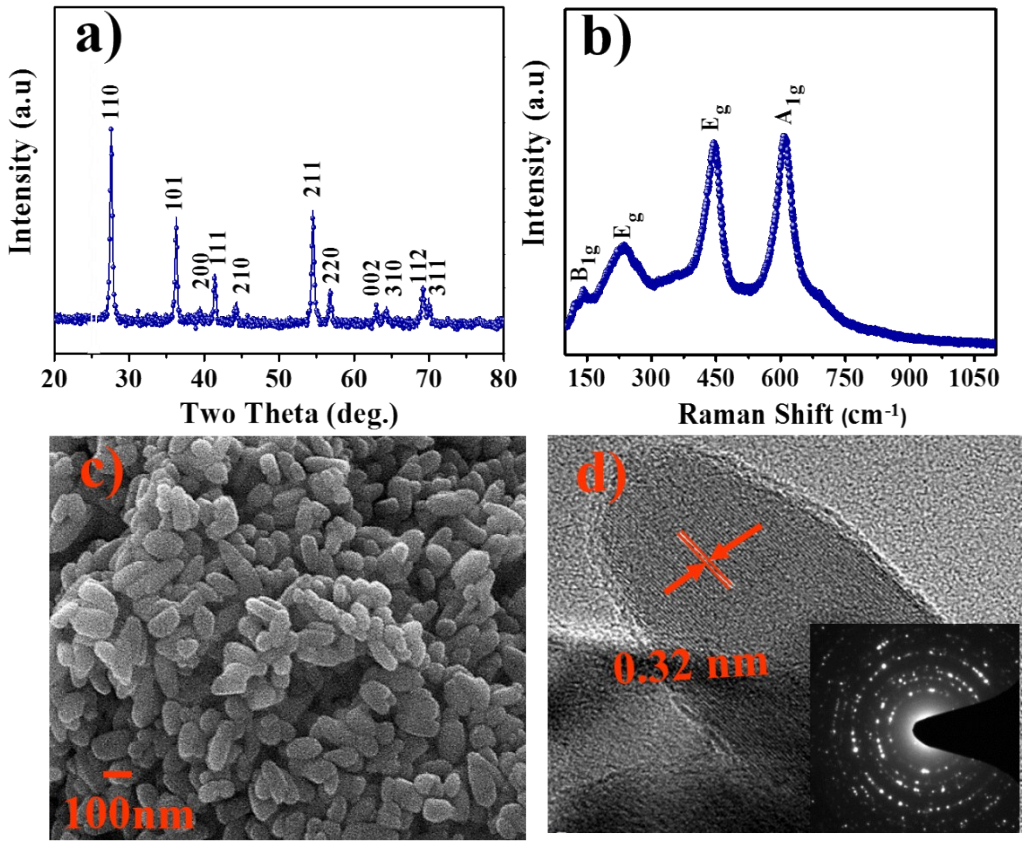


Fig. S2 a) X-ray diffraction pattern, b) Raman analysis, c) FE-SEM images, and HR-TEM images of R-TiO_2 was obtained without assistance of D-mannitol.

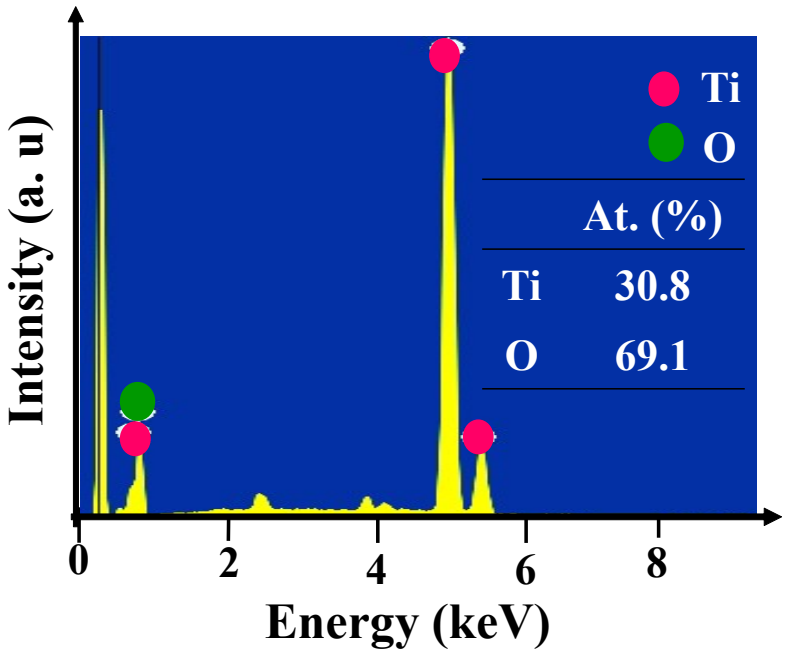


Fig. S3 the elemental stoichiometry determined by EDX mapping of TiO_2.

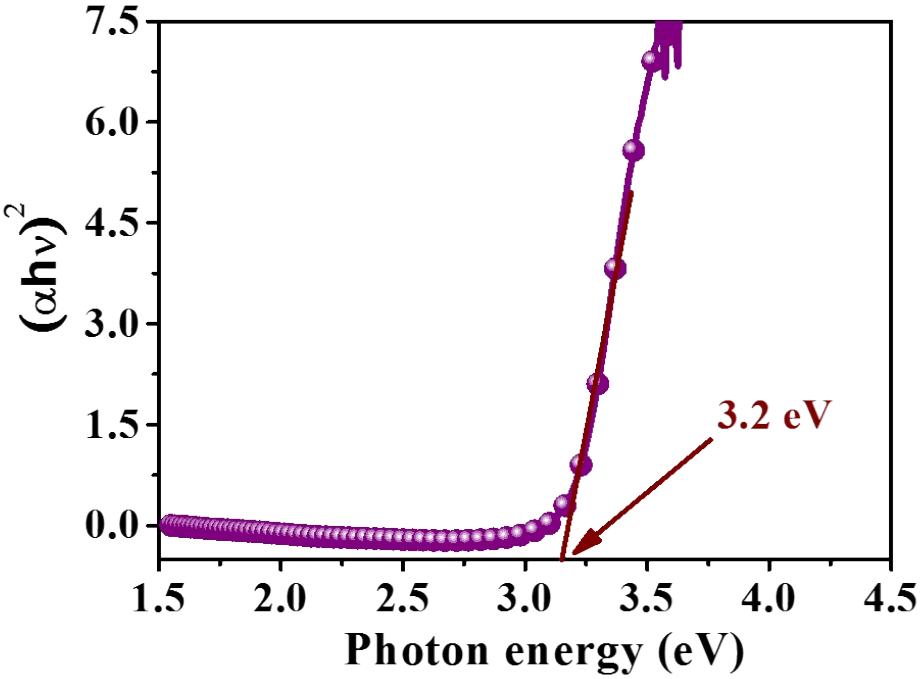
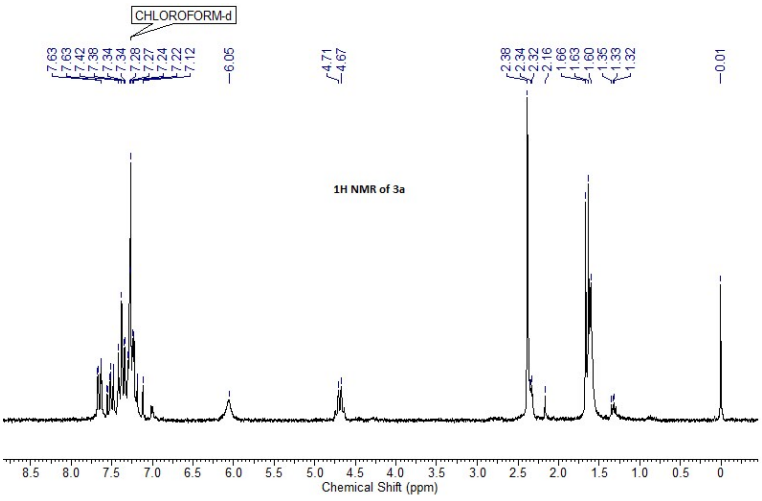
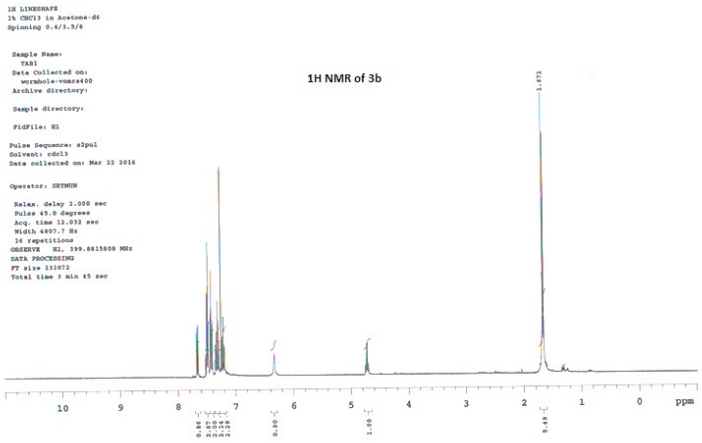


Fig. S4 Uv-Vis band gap of A-TiO_2 photoanode measured on FTO substrate.

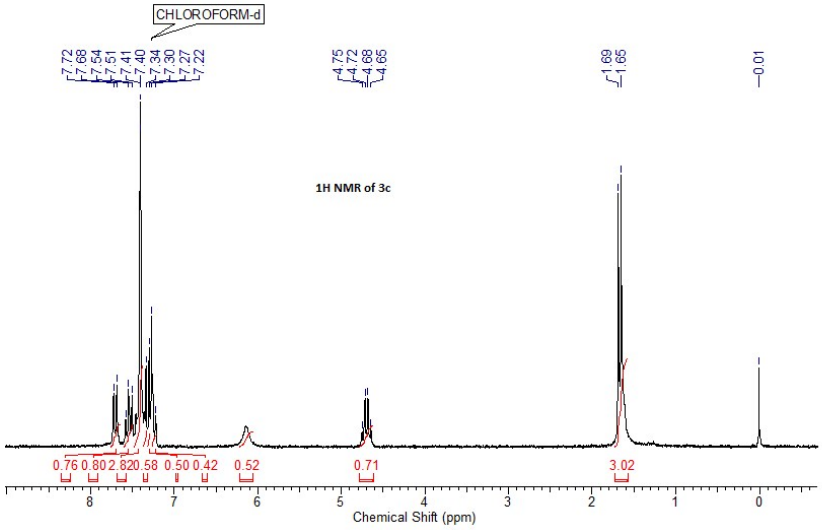
1) **^{1}HNMR of compound 3a**



2) **^{1}HNMR of compound 3b**



3) [1]HNMR of compound 3c



4) 1HNMR of compound 3d

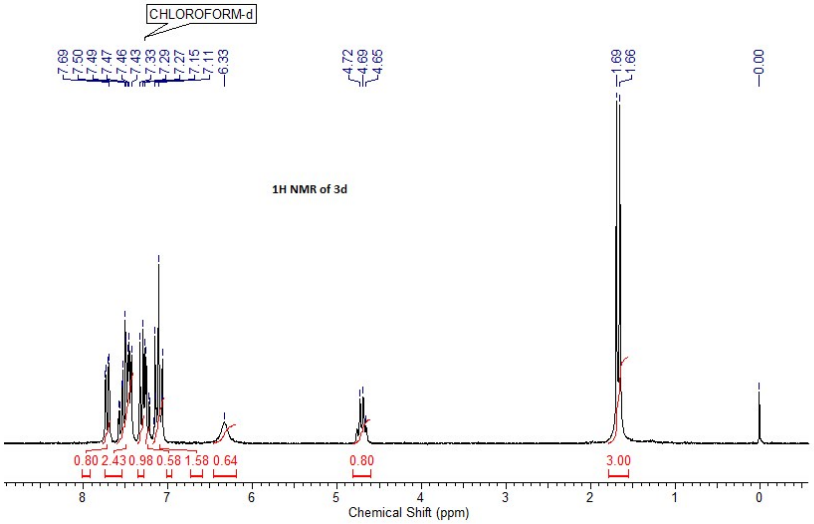


Table S1: Hall Measurement and electrical properties of A-TiO_2 nanocrystallite thin film on glass substrate.

Photoanode	Resistivity $\times 10^6$ Ω cm	Conductivity $\times 10^{-7}$ / Ω cm	Mobility cm^2/Vs	Sheet Concentration $\times 10^9$ /cm^2
A-TiO_2	3.35	2.96	0.124	-2.38