Supporting Information

Self-Assembled TiO_2 Nanospheres by using a Biopolymer as Template and its Optoelectronic Application

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Preparation of TiO_2 samples synthesized with ammonia in the absence of alginate biopolymer template from Titanium isopropoxide:

In a typical synthesis, ammonia (1.0 g) was added in 100 mL water by stirring and then titanium isopropoxide (3.5 mL) was added to this solution under vigorous stirring at room temperature. The pH of the reaction mixture was adjusted to 10 by the drop wise addition of aqueous ammonia (25%) solution. The reaction mixture was then divided into three parts in equal volume and separately stored in freeze at (0 °C), at room temperature and at 60 °C in hot oven for aging for 24 h. The resultant solids were collected by repeated centrifugation (6000 rpm, 15 min) and washing with distilled water. The solid was dried in oven at 80 °C for overnight (8 h) and then calcined at 300 °C in furnace for 4 h. TiO_2 materials prepared at 0 °C, room temperature, and under hydrothermal (60 °C) condition were designated as TiO_2-NH_3-F, TiO_2-NH_3-R, and TiO_2-NH_3-H respectively.

Figure S2. XRD profile of the TiO_2 samples synthesized with ammonia in the absence of alginate biopolymer template (TiO_2-NH_3-H, TiO_2-NH_3-R, and TiO_2-NH_3-F).

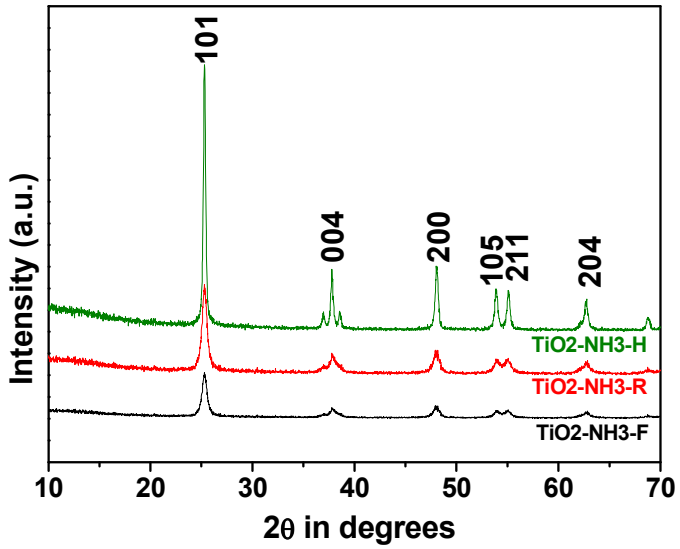

Figure S2. The FE-SEM image of calcined (300 °C) TiO_2 nanospheres (TiO_2-NH_3-R) prepared under hydrothermal condition at room temperature.

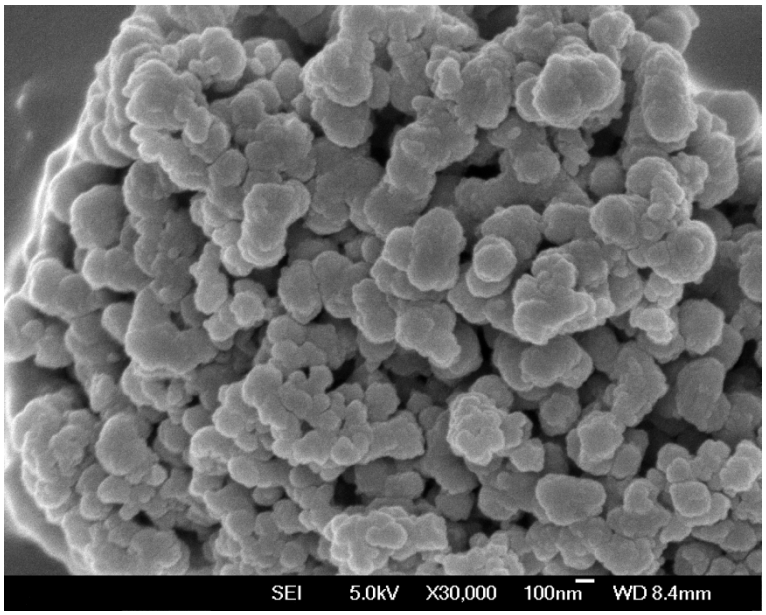

Figure S3. N_2 adsorption (•)-desorption (o) isotherm of the calcined TiO_2-F (a). The representative pore size distribution using NLDFT method is shown in (b).

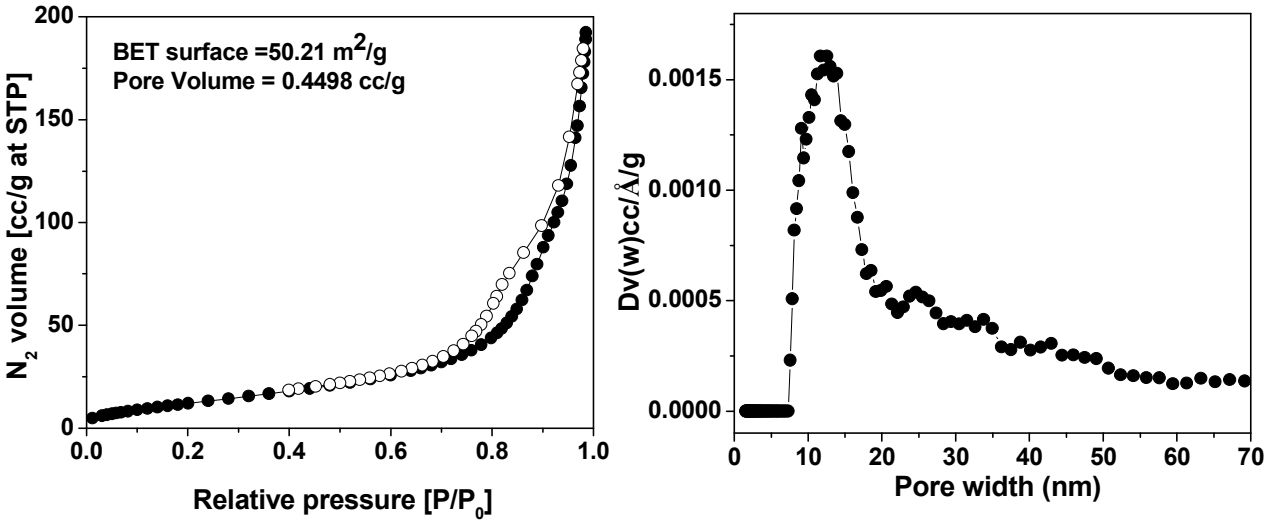

Figure S4. N_2 adsorption (•)-desorption (o) isotherm of the calcined TiO_2-NH_3-H (a), TiO_2-NH_3-R (b) and TiO_2-NH_3-F (c) at 77 K. The representative pore size distribution using NLDFT methods are shown in inset of the figures respectively.

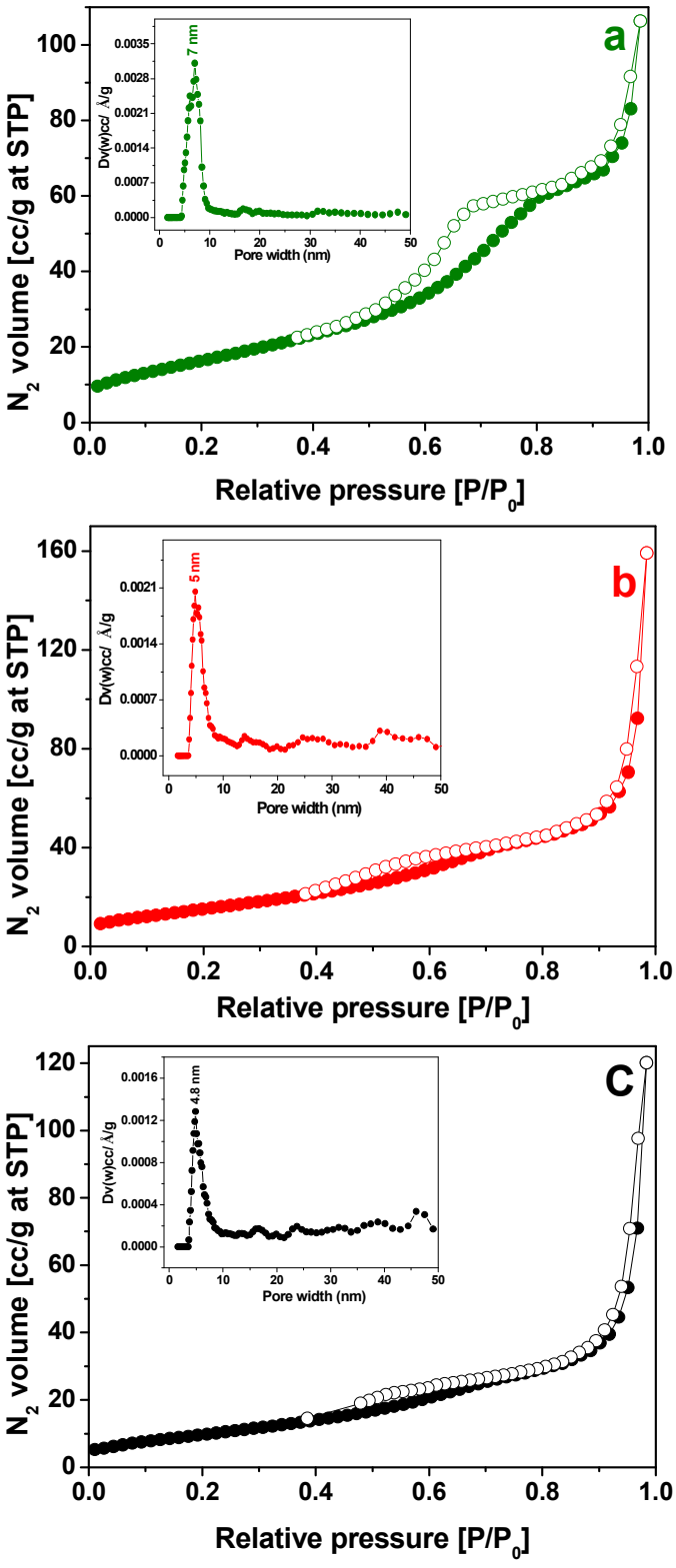

Table S1: Physico-chemical properties of TiO_2 nanosphere synthesized in the absence of sodium alginate.

Sample name	BET surface Area (m^2g^{-1})	Pore Volume (ccg^{-1})	Pore Diameter (nm)
TiO_2-NH_3-H	60.0	0.1281	7
TiO_2-NH_3-R	55.2	0.1214	5
TiO_2-NH_3-F	35.4	0.1143	4.8