Supporting Information

Design and Application of Au Decorated ZnO/TiO_2 as a Stable Photocatalyst for Wide Spectral Coverage

Soumita Mukhopadhyay,[a] Debabrata Maiti,[a] Sabyasachi Chatterjee,[b] Parukuttyamma Sujatha Devi[a]* and Gopinatha Suresh Kumar[b]

[a]*Sensor and Actuator Division, CSIR-Central Glass and Ceramic Research Institute, 196,Raja S.C. Mullick Road, Jadavpur, Kolkata 700032, India*

[b]*Chemistry Division, CSIR-Indian Institute of Chemical Biology, 4,Raja S.C. Mullick Road, Jadavpur, Kolkata 700032, India*

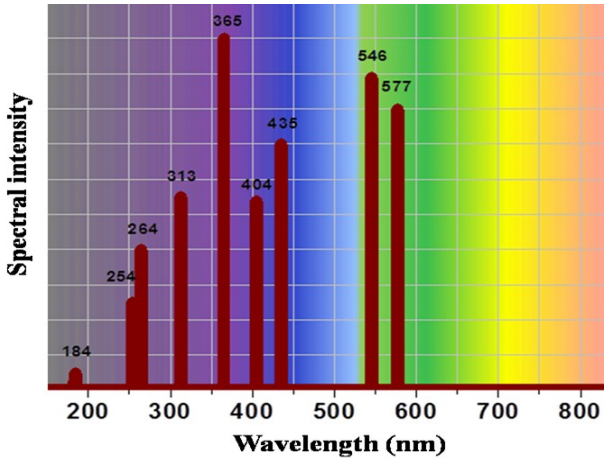

Figure S1. Spectral distribution of high pressure mercury lamp (250 W).

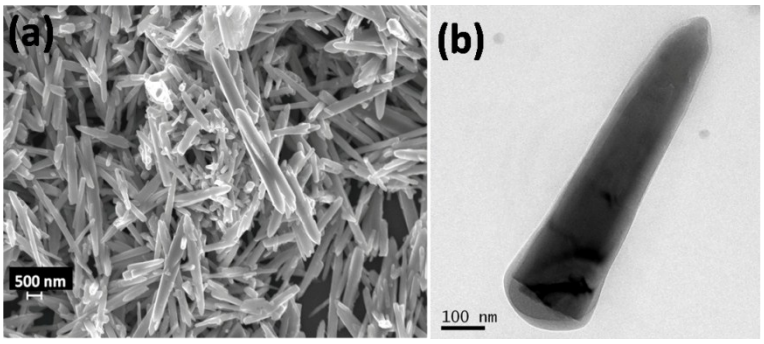

Figure S2. (a) FESEM and (b) TEM images of native ZnO rods.

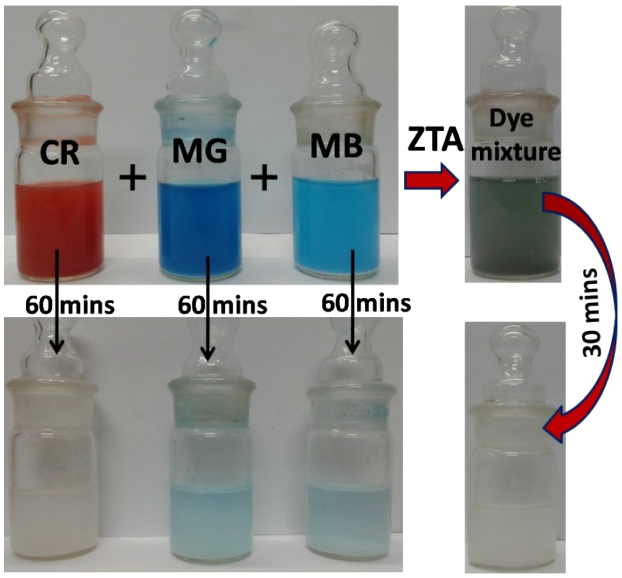

Figure S3. Digital photograph of CR, MG, MB and their mixture in presence of ZnO/TiO_2 /Au as a photocatalyst while photocatalytic dye degradation under UV-Visible irradiation source.

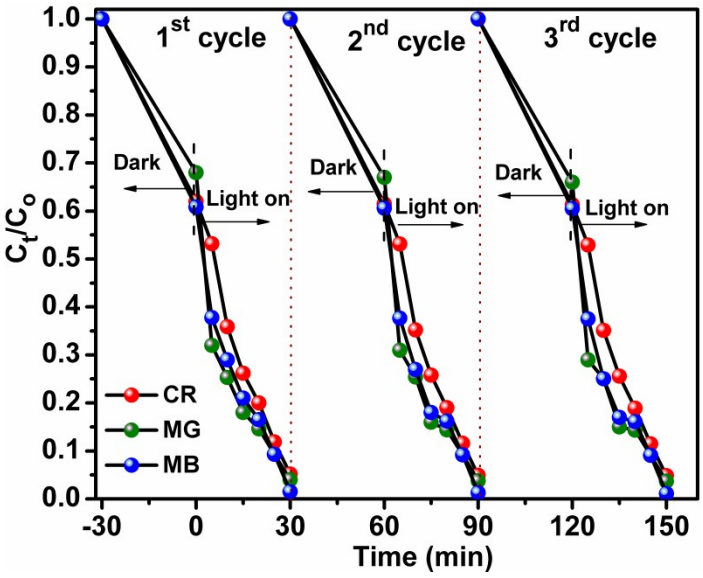

Figure S4. Three cycle photocatalytic degradation plot of dye mixture (CR-MG-MB) under UV-Visible light exposure employing ternary composite ZnO/TiO_2 /Au as a photocatalyst.

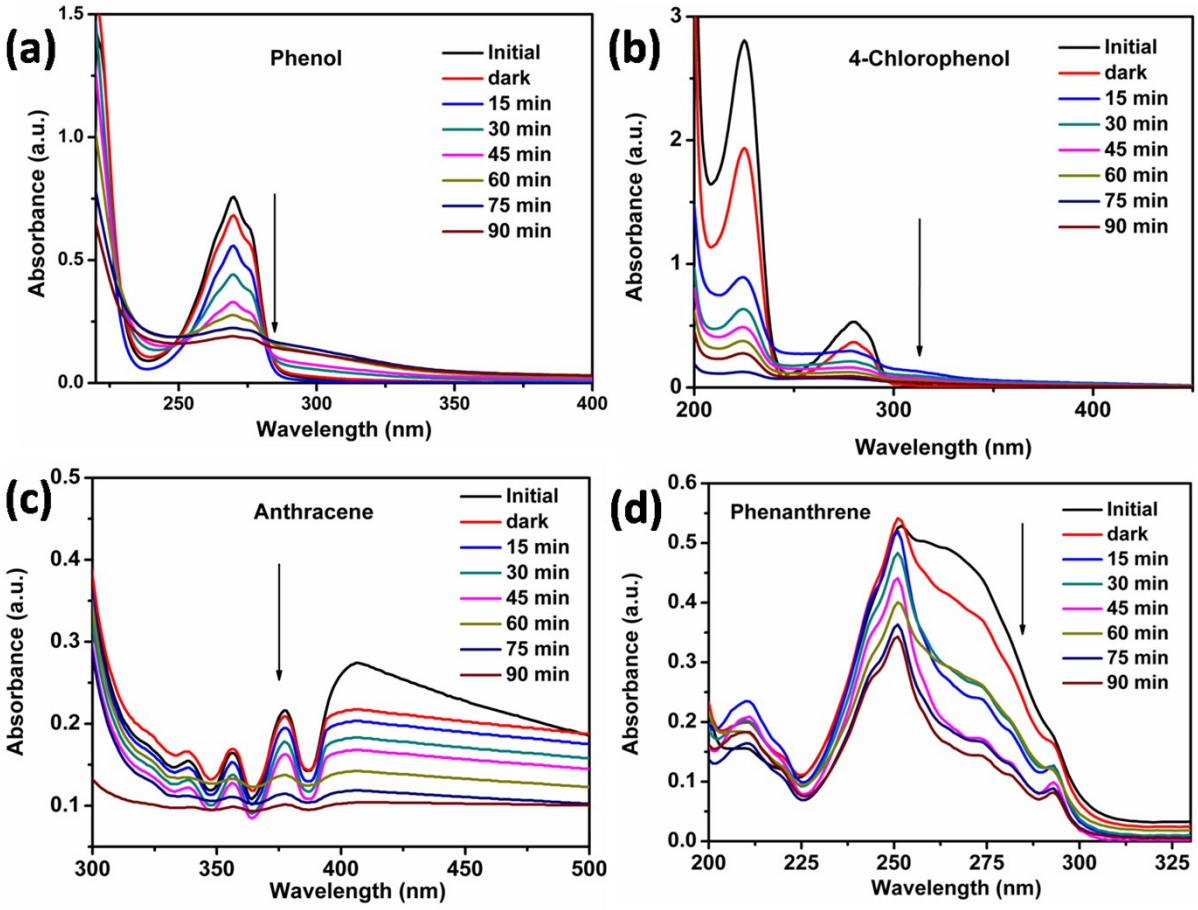

Figure S5. UV-Vis absorption spectra of (a) phenol, (b) 4-chlorophenol, (c) anthracene and (d) phenanthrene after irradiation of 90 min employing ternary composite (ZTA) under UV-visible light.

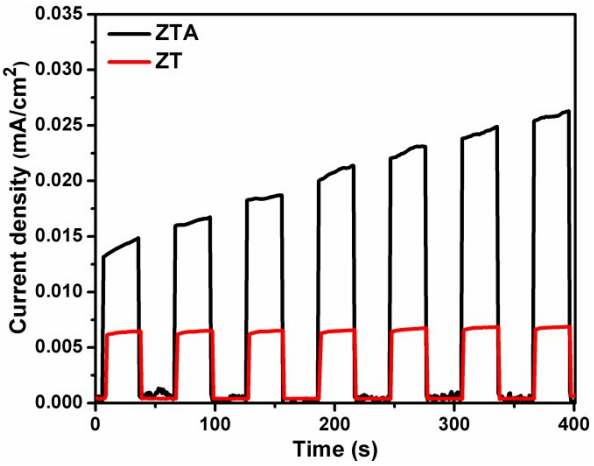

Figure S6. Photocurrent response through on–off cycles at zero bias volt vs. Ag/AgCl/3 M KCl employing ZnO/TiO_2 (ZT) and ZnO/TiO_2 /Au (ZTA) as photoanodes under visible light exposure.

Table S1. Photocatalytic performance of ZnO/TiO_2/Au photocatalyst (10 mg) for the degradation of dye mixture (CR+MG+MB) under UV-Visible, UV and Visible light irradiation for 30 minutes.

Irradiation source	**(CR+MB+MG), 2.5 x 10^{-5} M**	**Rate constant k (min^{-1})**
UV-Visible	CR	0.088
	MB	0.114
	MG	0.09
UV	CR	0.065
	MB	0.068
	MG	0.059
Visible	CR	0.033
	MB	0.037
	MG	0.026