Supporting Information

Enhanced Thermal Stability under DC Electrical Conductivity Retention and Visible Light Activity of Ag/TiO_2@Polyaniline Nanocomposite Film

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Table S1: Structural refined data of TiO_2 nanoparticles in Ag/TiO_2@Pani nanocomposite film

Phase	**Anatase**	**Rutile**
Crystal Structure	Tetragonal	Tetragonal
Space Group	*I 41/a m d*	*P 42/m n m*
a = b (Å)	4.7773	3.7814
C (Å)	2.5271	9.4443
Phase %	78.12	21.88
Crystallite size (~ nm)	16	23

Table S2: DC Electrical Conductivity of Pani and Ag/TiO_2@Pani nanocomposite film under cyclic aging conditions

Temp. (°C)	Samples	DC Electrical Conductivity-σ (S/cm)				
		Cycle-1	Cycle-2	Cycle-3	Cycle-4	Cycle-5
40	Pani	4.59	0.34	0.23	0.42	0.76
50		5.09	0.39	0.27	0.49	0.87
60		4.75	0.45	0.31	0.55	0.99
70		4.77	0.50	0.34	0.62	1.11
80		4.78	0.57	0.39	0.71	1.28
90		4.84	0.63	0.43	0.78	1.40
100		4.75	0.68	0.48	0.87	1.57
110		4.84	0.77	0.54	0.97	1.75
120		4.91	0.84	0.59	1.07	1.92
130		5.08	0.92	0.67	1.20	2.15
140		5.18	1.01	0.72	1.30	2.33
150		5.58	1.04	0.77	1.39	2.51
40	Ag/ TiO_2@Pani	5.45	9.81	1.13	2.04	3.67
50		5.36	9.65	1.24	2.23	4.02
60		6.37	11.46	1.33	2.39	4.31
70		7.20	12.96	1.38	2.49	4.49
80		7.92	14.25	1.45	2.62	4.72
90		10.18	18.33	1.56	2.81	5.07
100		12.45	22.42	1.63	2.94	5.30
110		14.90	26.83	1.71	3.07	5.54
120		16.97	30.55	1.80	3.24	5.83
130		15.28	27.51	1.83	3.31	5.94
140		15.32	20.38	1.89	3.40	6.12
150		15.68	13.08	1.91	3.43	6.18

TEM images of Ag/TiO_2 nanocomposite

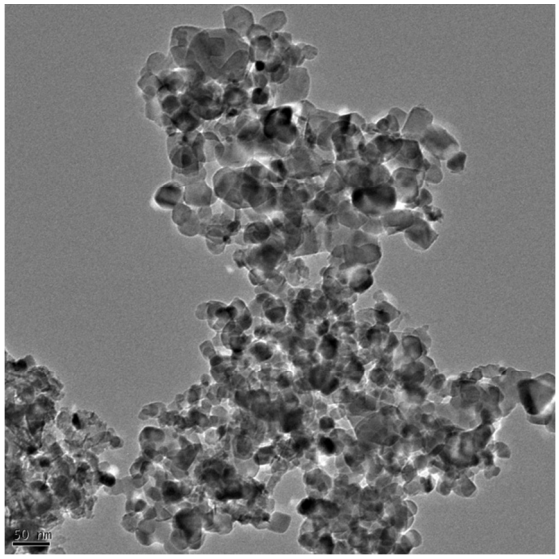


Figure S1. TEM image of Ag/TiO_2 nanocomposite.

HR-TEM image of Ag/TiO_2 nanocomposite

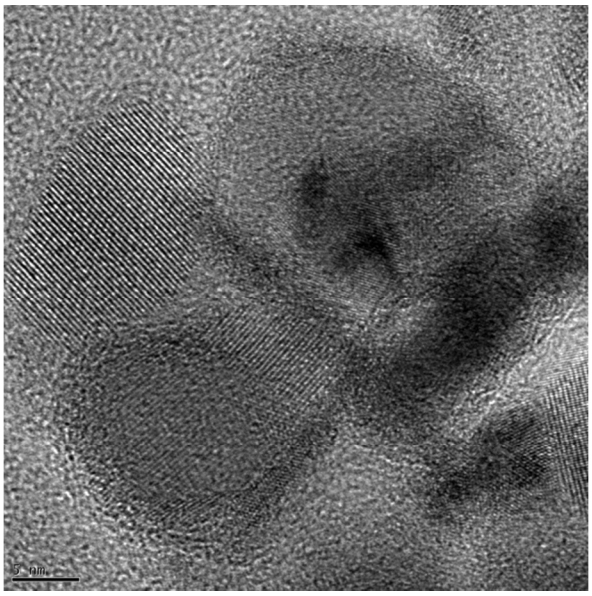


Figure S2. HR-TEM image of Ag/TiO_2 nanocomposite.

SEM images of Pani and Ag/TiO_2@Pani nanocomposite film

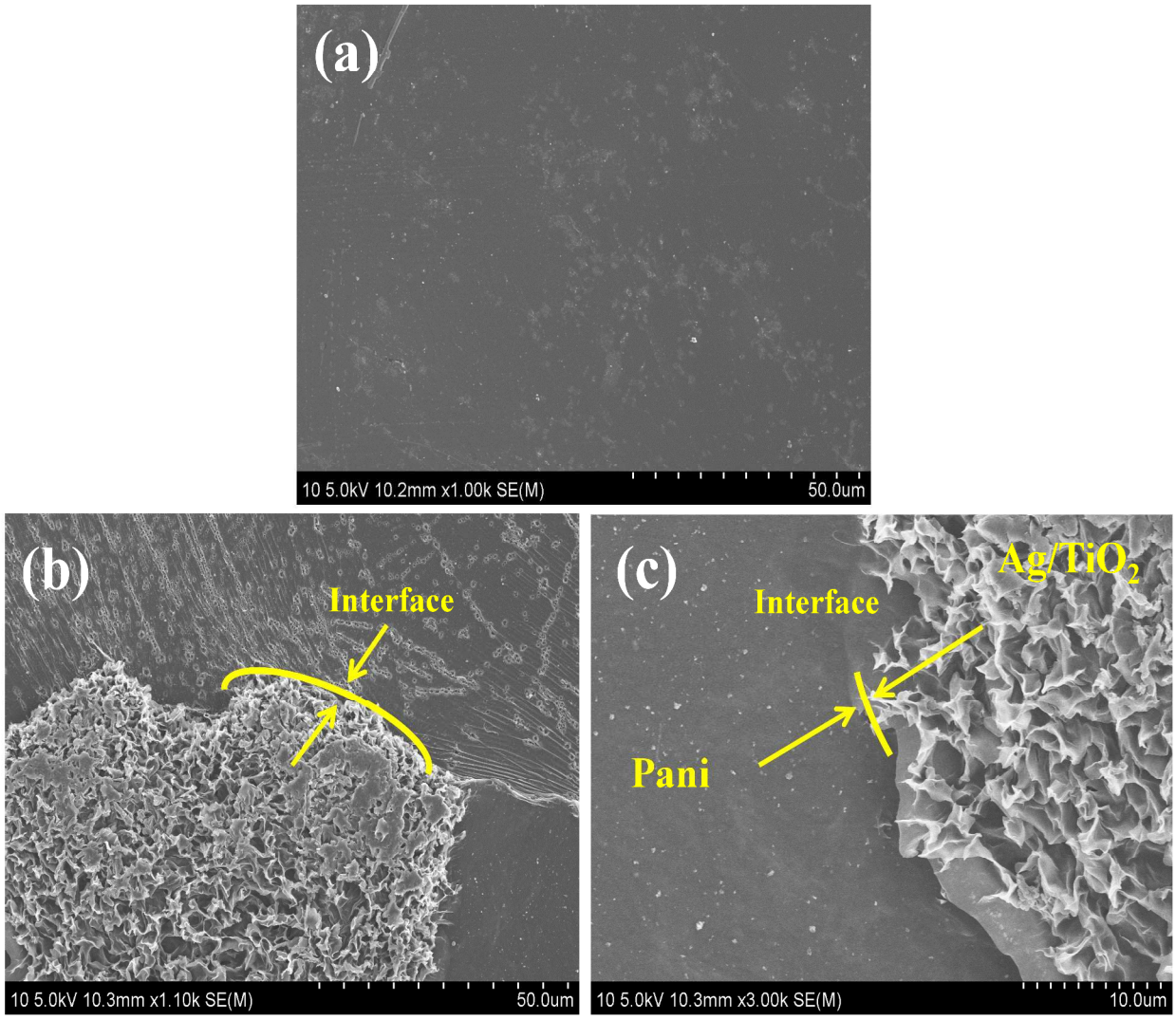


Figure S3. SEM images of **(a)** as-prepared Pani, **(b** and **c)** Ag/TiO_2@Pani film.

Diffuse reflectance spectra of Pani and Ag/TiO_2@Pani nanocomposite film

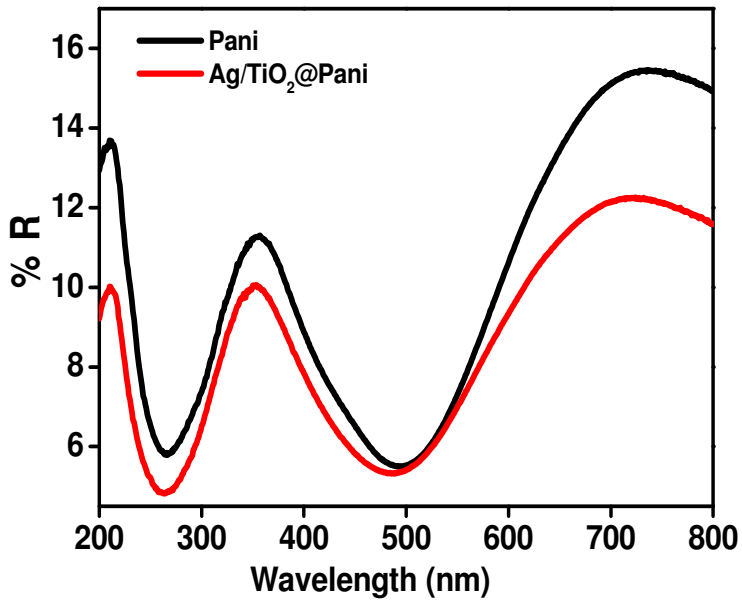
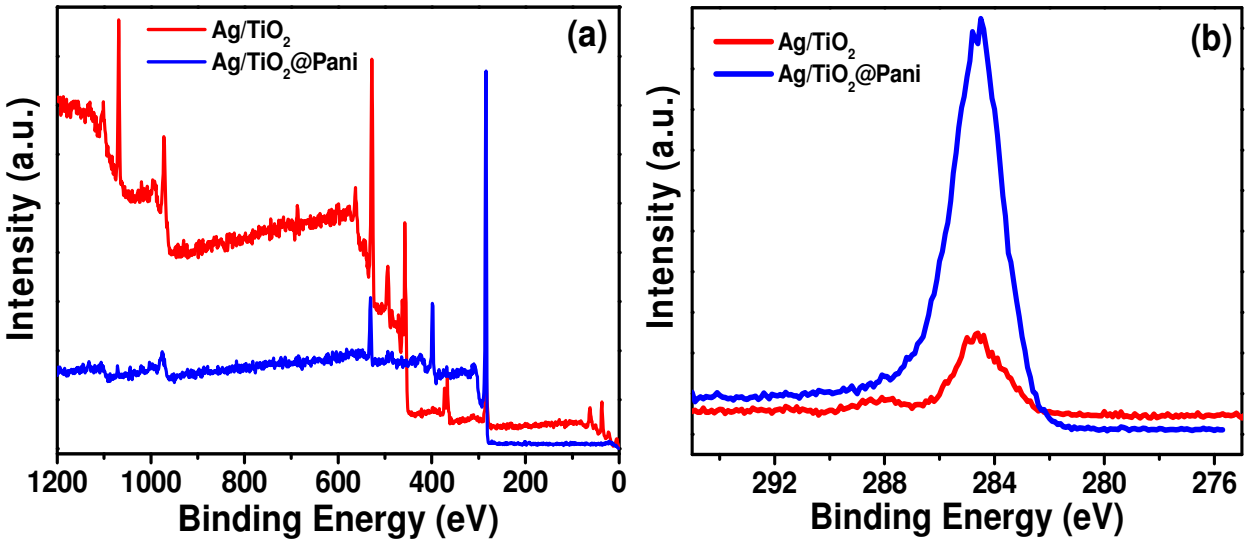


Figure S4. Diffuse reflectance spectra of Pani and Ag/TiO_2@Pani nanocomposite film.

XPS spectra of Ag/TiO_2 and Ag/TiO_2@Pani nanocomposite film



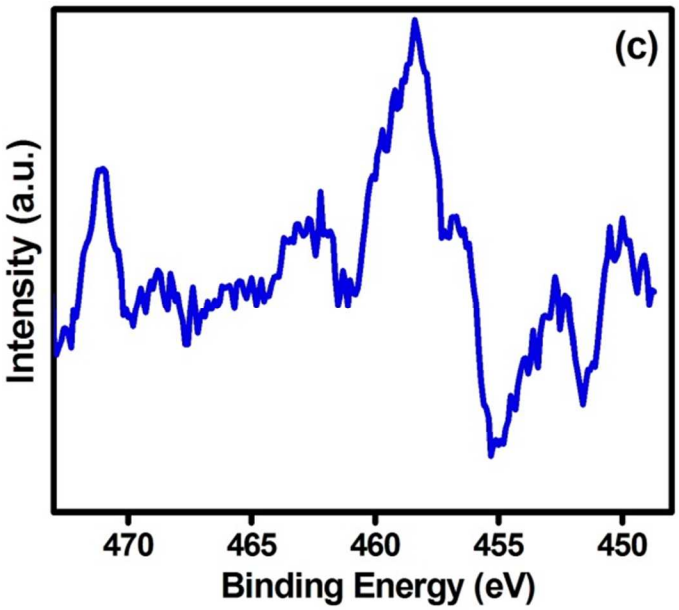


Figure S5. XPS spectra of Ag/TiO_2 and Ag/TiO_2@Pani nanocomposite film: (**a**) survey spectra, (**b**) C1s peaks, and (c) Ti 2p peaks of Ag/TiO_2@Pani nanocomposite film.

Activation energy of Pani and Ag/TiO_2@Pani nanocomposite film

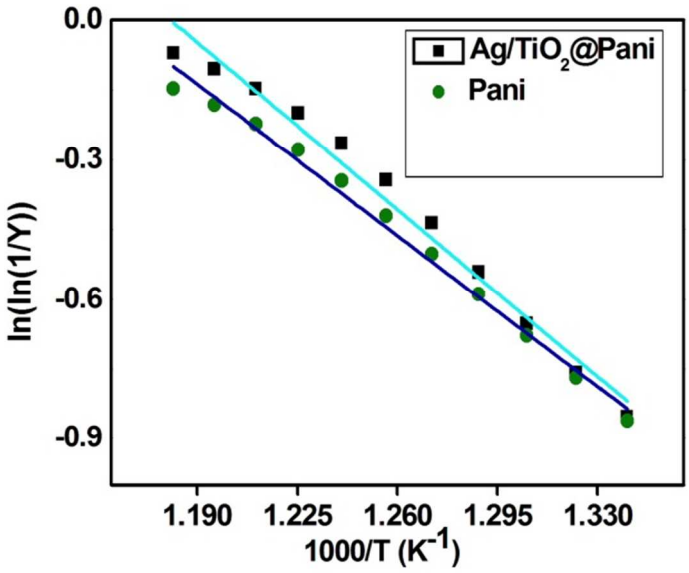


Figure S6. Activation energy curve of Pani and Ag/TiO_2@Pani nanocomposite film.

Plot of C/C_0 vs. the irradiation time (h) for the photodegradation of MB by Pani and Ag/TiO_2@Pani nanocomposite film

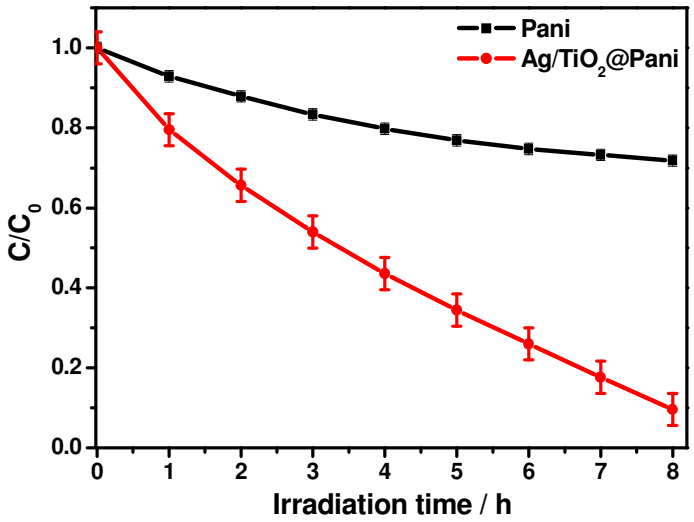


Figure S7. Plot of C/C_0 vs. the irradiation time (h) for the photodegradation of MB by Pani and Ag/TiO_2@Pani nanocomposite film.