Electronic Supplementary Material (ESI) for Materials Advances.

Green synthesis of CuO/rGO nanocomposites using Terminalia Arjuna bark extract and its expected catalytic behavior towards purification of water

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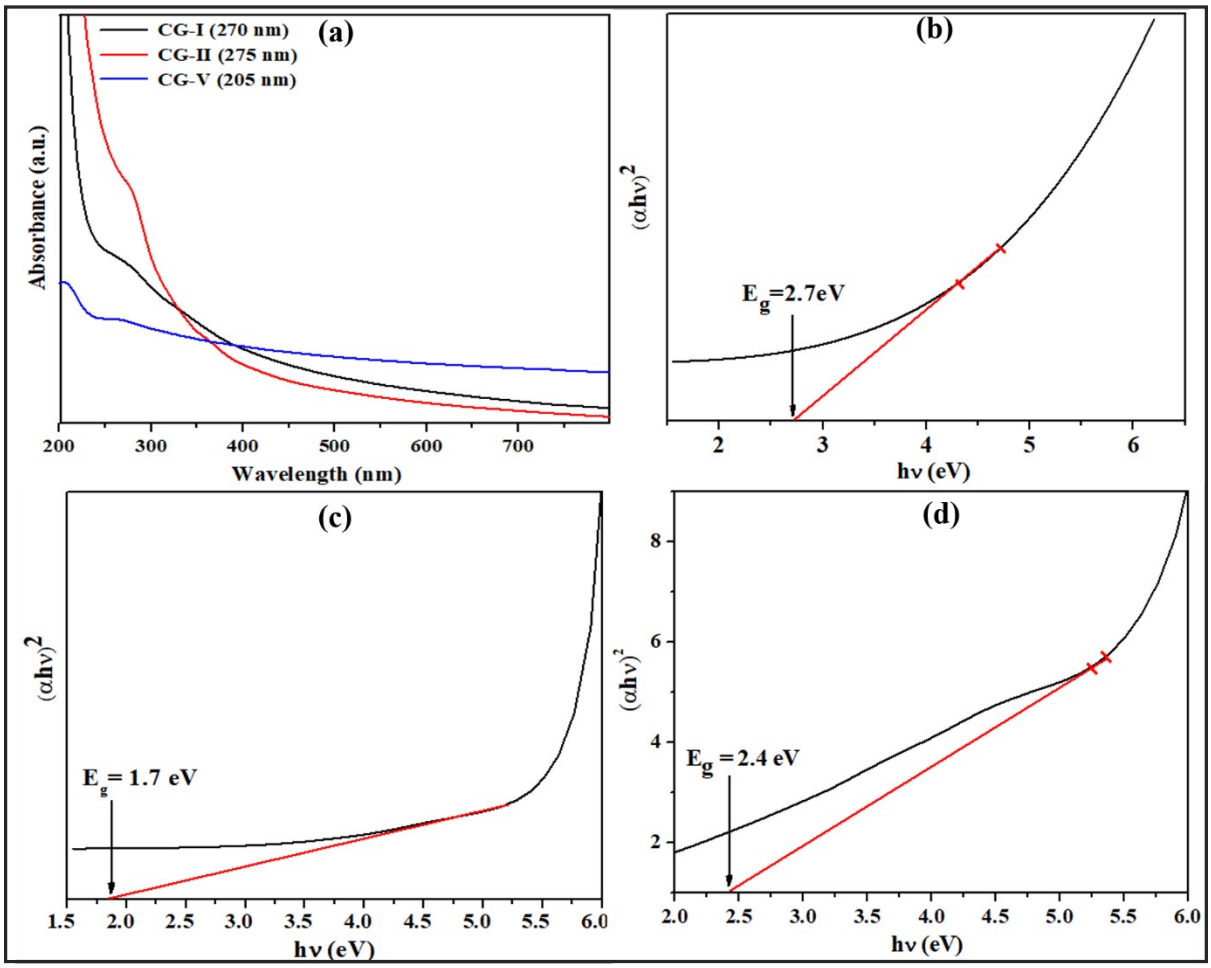

Fig. S1. a) UV–visible spectra of CuO, rGO and CuO/rGO nanocomposite; b-d) Tauc plot for CuO, rGO and CuO/rGO nanocomposite

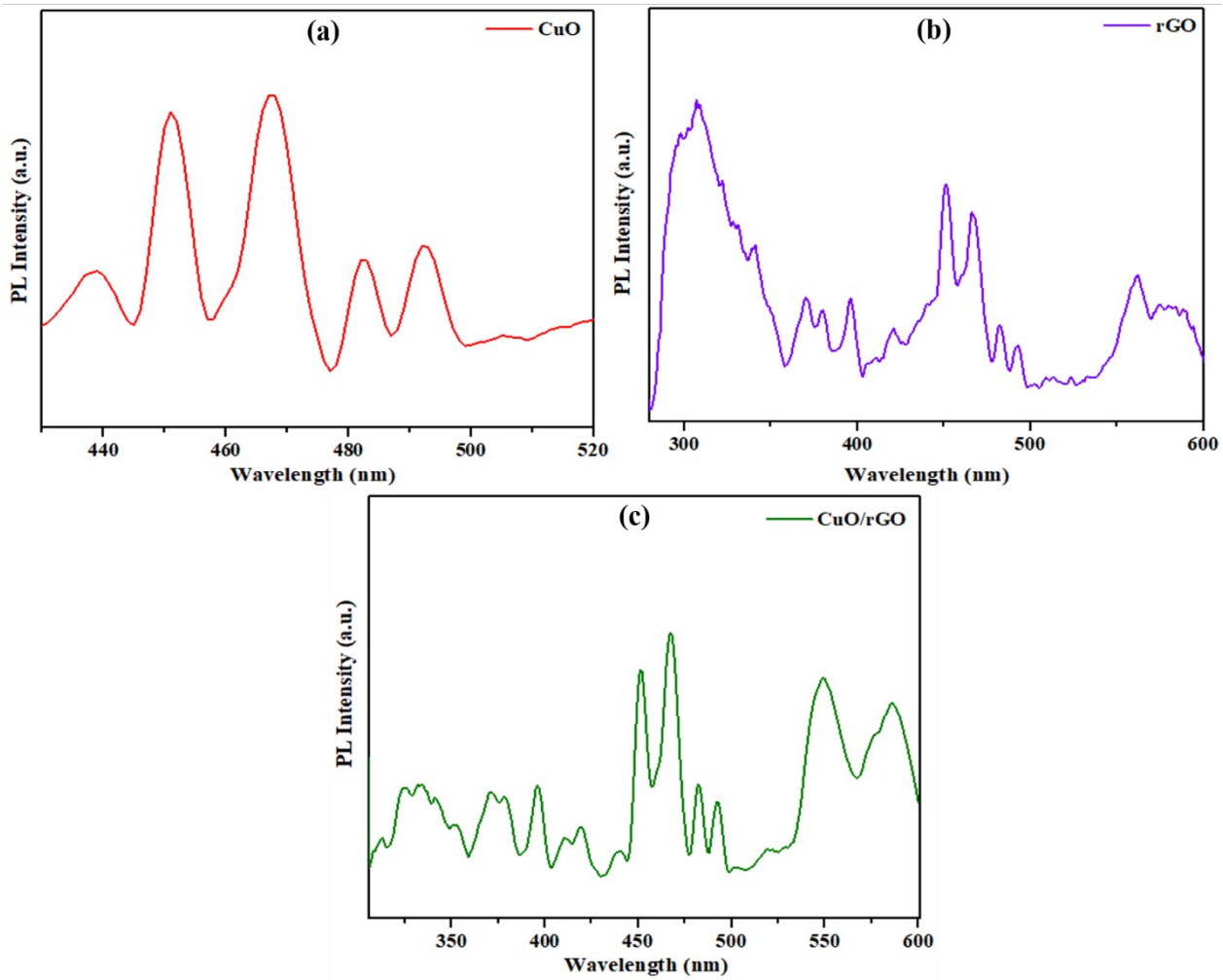

Fig. S2. PL spectra of a) CuO; b) rGO and c) CuO/rGO nanocomposite

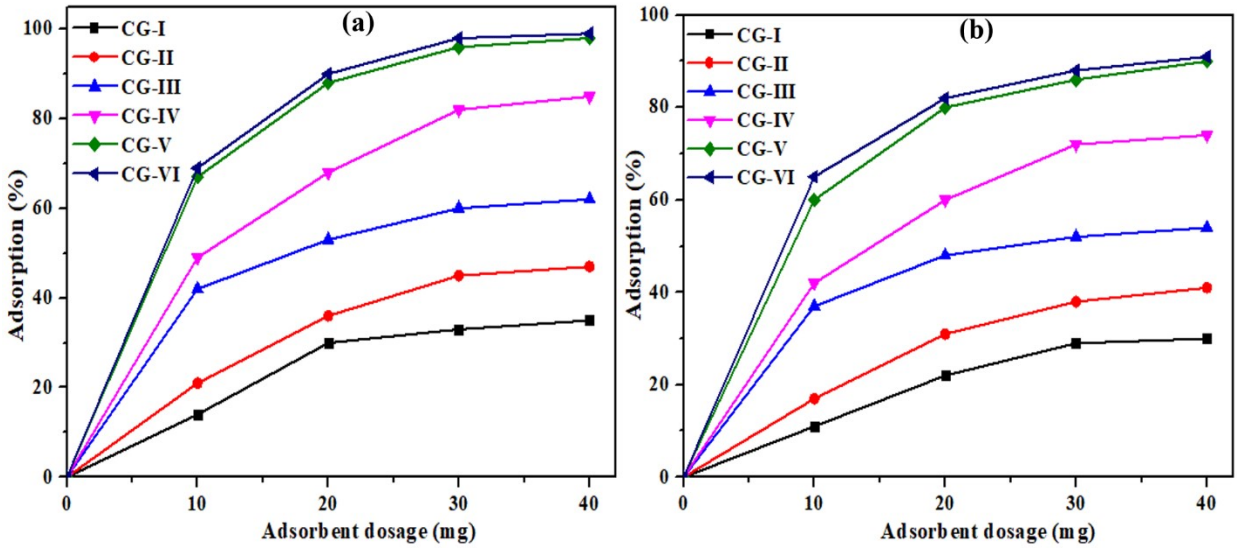

Fig. S3. Effect of adsorbent dosage on the percentage adsorption of (a) Bi^{3+} and (b) Cd^{2+} ions on various adsorbent samples of rGO, CuO and CuO/rGO nanocomposites

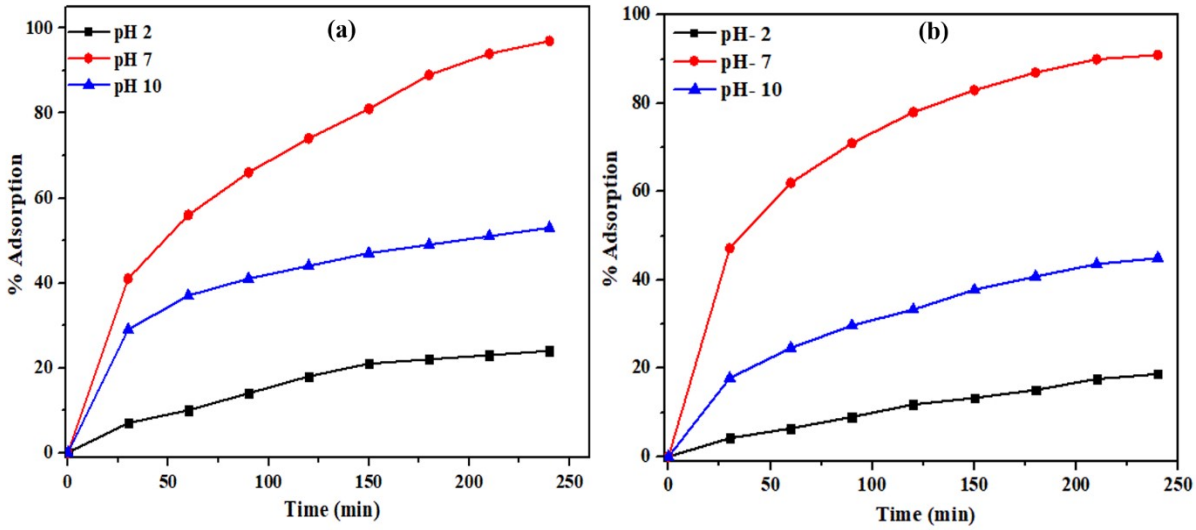

Fig. S4. Effect of pH on the percentage adsorption of (a) Bi^{3+} and (b) Cd^{2+} ions onto CG-V (0.75:1.00) nanocomposite

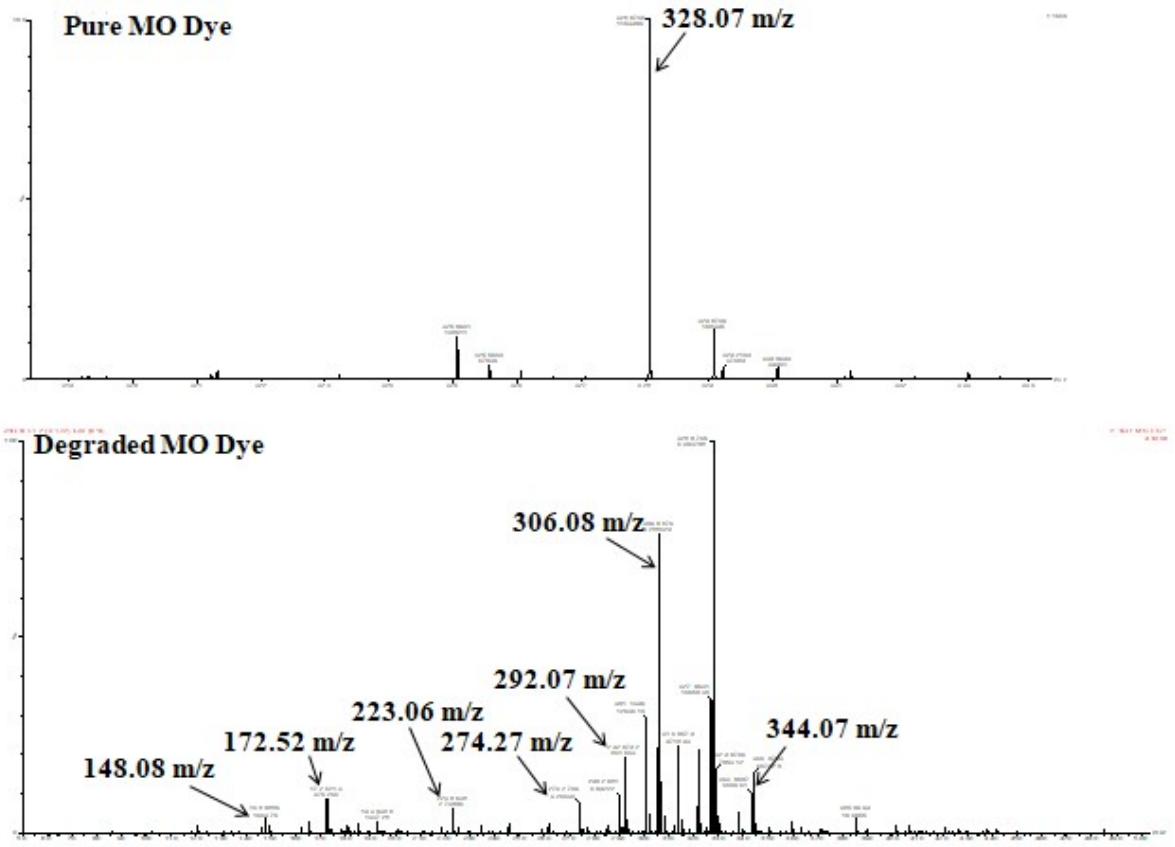

Fig. S5. LC-MS indicating principal by-products of photocatalytic degradation of MO

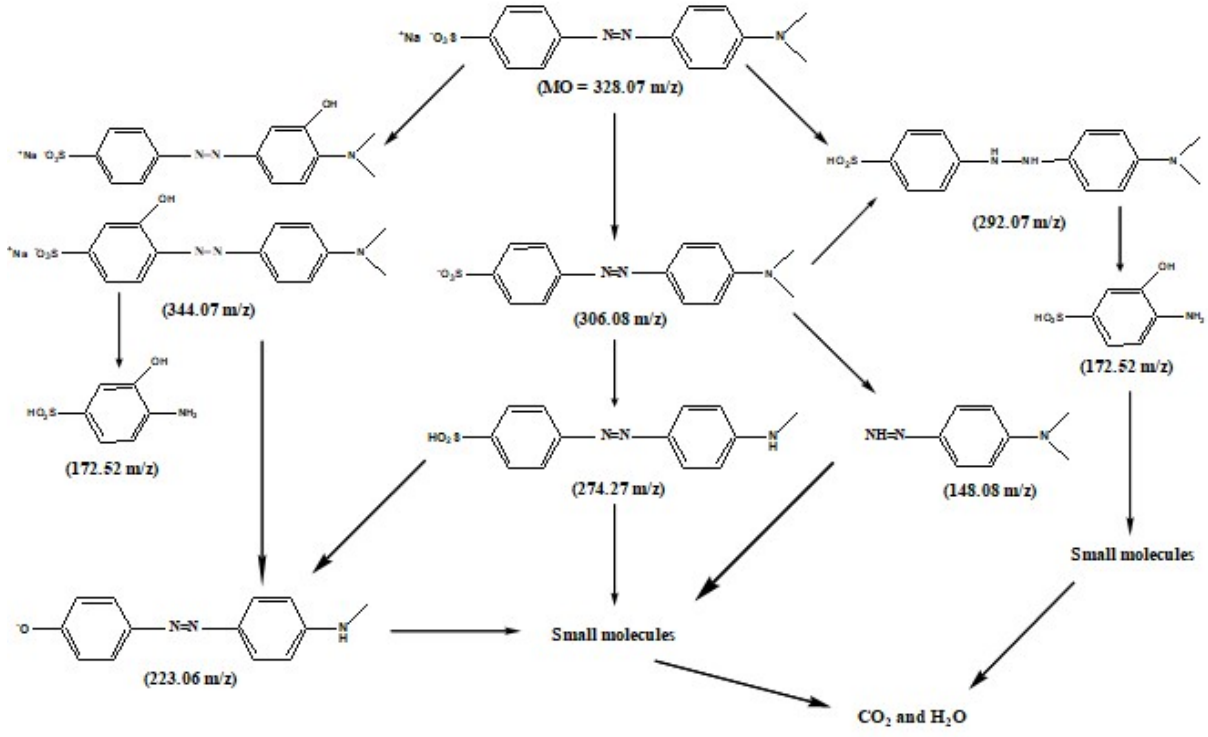

Fig. S6. Probable transformation pathways for photocatalytic degradation of MO

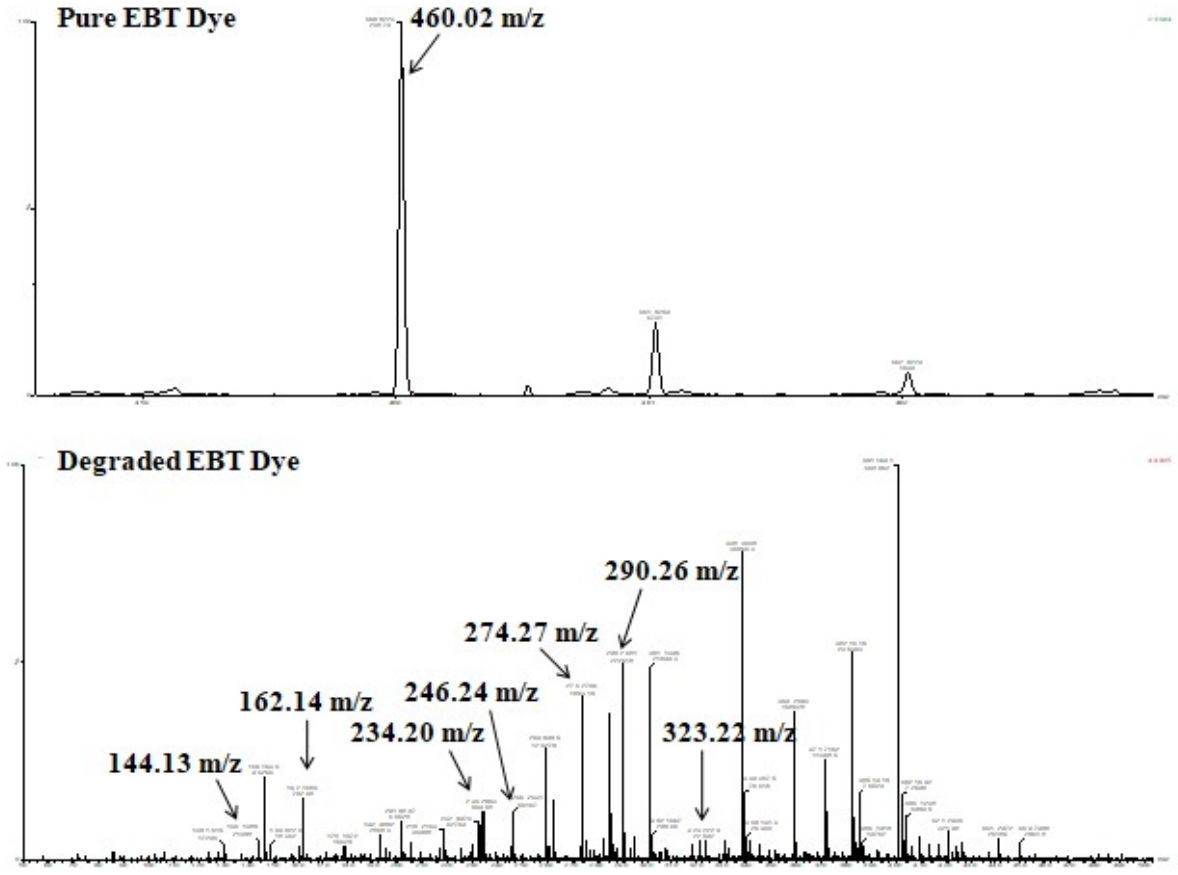

Fig. S7. LC-MS indicating principal by-products of photocatalytic degradation of EBT

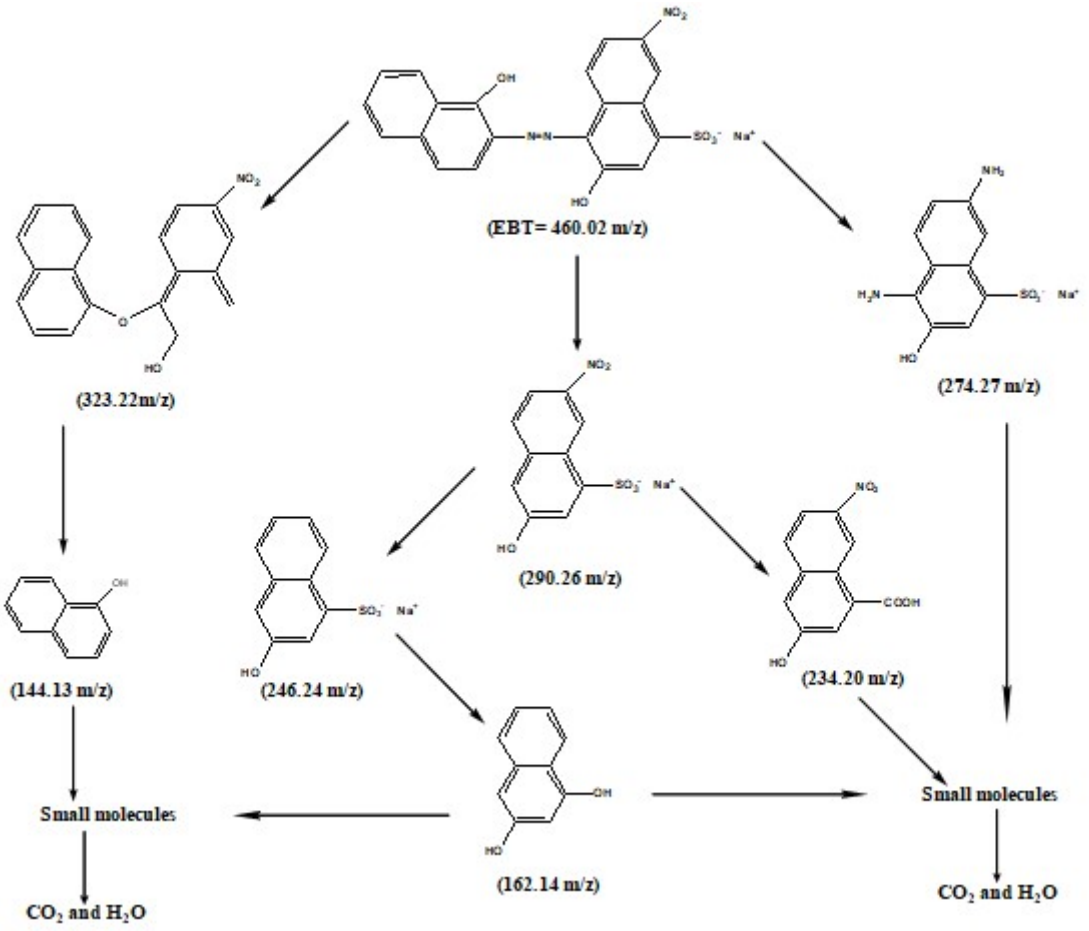

Fig. S8. Probable transformation pathways for photocatalytic degradation of EBT

Table S1. Various adsorption models for Bi^{3+} adsorption on CuO/rGO nanocomposite

Sample	Langmuir			Freundlich			Temkin		
	q_m	R^2	R_L	K_f	n	R^2	K_T	B	R^2
CG-I (0.00:1.00)	58.8	0.91	0.26	0.47	2.6	0.91	0.00007	0.0006	0.93
CG-II (1.00:0.00)	70.9	0.95	0.27	0.44	2.3	0.95	0.00009	0.0007	0.97
CG-III (0.25:1.00)	52.6	0.86	0.24	0.54	4.5	0.99	0.00005	0.0005	0.99
CG-IV (0.50:1.00)	90.9	0.99	0.26	0.43	2.9	0.99	0.00009	0.0008	0.99
CG-V (0.75:1.00)	138.8	0.99	0.22	0.53	3.5	0.99	0.00008	0.0008	0.99
CG-VI (1.00:1.00)	126.5	0.99	0.21	0.56	4.8	0.99	0.00004	0.0004	0.99

Table S2. Various adsorption models for Cd^{2+} adsorption on CuO/rGO nanocomposite

Sample	Langmuir			Freundlich			Temkin		
	q_m	R^2	R_L	K_f	n	R^2	K_T	B	R^2
CG-I (0.00:1.00)	66.6	0.99	0.29	0.30	1.62	0.99	0.00007	0.0005	0.95
CG-II (1.00:0.00)	55.5	0.94	0.26	0.44	2.3	0.94	0.00009	0.0007	0.95
CG-III (0.25:1.00)	83.3	0.98	0.27	0.41	2.1	0.98	0.00001	0.0008	0.99
CG-IV (0.50:1.00)	91.5	0.99	0.27	0.41	2.3	0.99	0.00001	0.0009	0.99
CG-V (0.75:1.00)	112.4	0.99	0.22	0.62	3.0	0.99	0.00008	0.0007	0.99
CG-VI (1.00:1.00)	93.4	0.96	0.21	0.58	4.9	0.96	0.00002	0.0003	0.98

Table S3. Different variables for pseudo first and second order kinetics for EBT dye

Sample	1st Order Reaction		2nd Order Reaction	
	K_1	R^2	K_2	R^2
CG-I (0.00:1.00)	0.0041	0.97	$3.6x10^4$	0.99
CG-II (1.00:0.00)	0.0039	0.90	$3.7x10^4$	0.99
CG-III (0.25:1.00)	0.0096	0.96	$3.4x10^3$	0.97
CG-IV (0.50:1.00)	0.0122	0.98	$7.3x10^3$	0.99
CG-V (0.75:1.00)	0.0126	0.98	$1.3x10^3$	0.99
CG-VI (1.00:1.00)	0.0368	0.99	$8.1x10^3$	0.99

Table S4. Different variables for pseudo first and second order kinetics for MO dye

Sample	1st Order Reaction		2nd Order Reaction	
	K_1	R^2	K_2	R^2
CG-I (0.00:1.00)	0.0041	0.98	$1.6x10^4$	0.99
CG-II (1.00:0.00)	0.0046	0.98	$1.7x10^4$	0.99
CG-III (0.25:1.00)	0.0064	0.97	$6.7x10^3$	0.99
CG-IV (0.50:1.00)	0.0082	0.98	$7.2x10^3$	0.99
CG-V (0.75:1.00)	0.0126	0.99	$1.6x10^3$	0.99
CG-VI (1.00:1.00)	0.0345	0.99	$8.0x10^3$	0.99