Supporting Information

Enhanced photocatalytic degradation of methylene blue dye via enabling valorization of polyethylene terephthalate plastic waste derived metal-organic framework based ZnO@Co-BDC composite catalyst

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Table S1. Comparison of MB photodegradation efficiency with other catalysts.

No.	Catalyst	% of degradation	Time (min)	References
1	Ti-ZnO	80%	150 min	1
2	ZnO/CuO	90%	240 min	2
3	$MnTiO_3/TiO_2$	75%	240 min	3
4	CuO–ZnO (20%)	82%	105 min	4
5	0.08CrZn	85%	90 min	5
6	CsLZnO-NPs	80%	240 min	6
7	*Parthenium hysterophorus*-Mediated ZnO	55.69%	32 min	7
8	20% ZnO/Cu-DPA	87%	80min	8
9	Co-doped ZnO	62.6%	140 min	9
10	Ag-Zn	85%	60 min	10
11	Fe_2O_3/ZnO	79%	150 min	11
12	ZnO@Co-BDC	91%	80 min	This study

Table S2. The calculated VB and CB energy edge of ZnO and Co-BDC

Catalyst	Eg	E_{VB}	E_{CB}
ZnO	3.38	2.98	-0.48
Co-BDC	2.35	2	-0.54

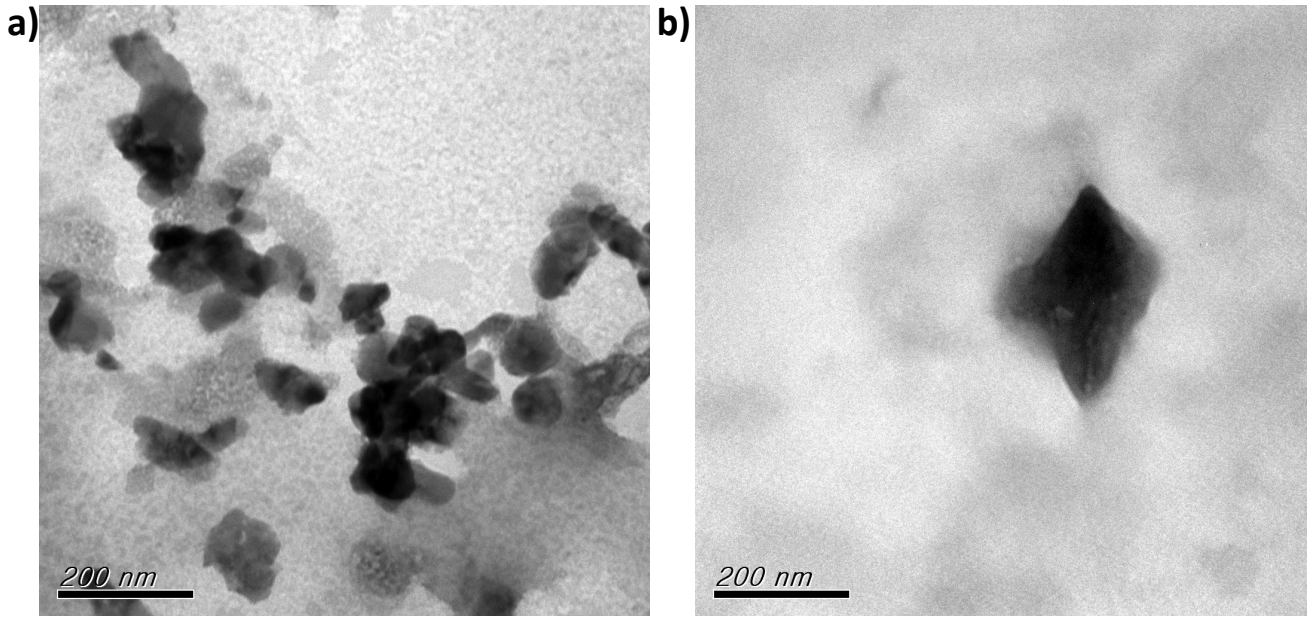

Fig S1. The TEM images of (a) Co-BDC and (b) ZnO@Co-BDC composites.

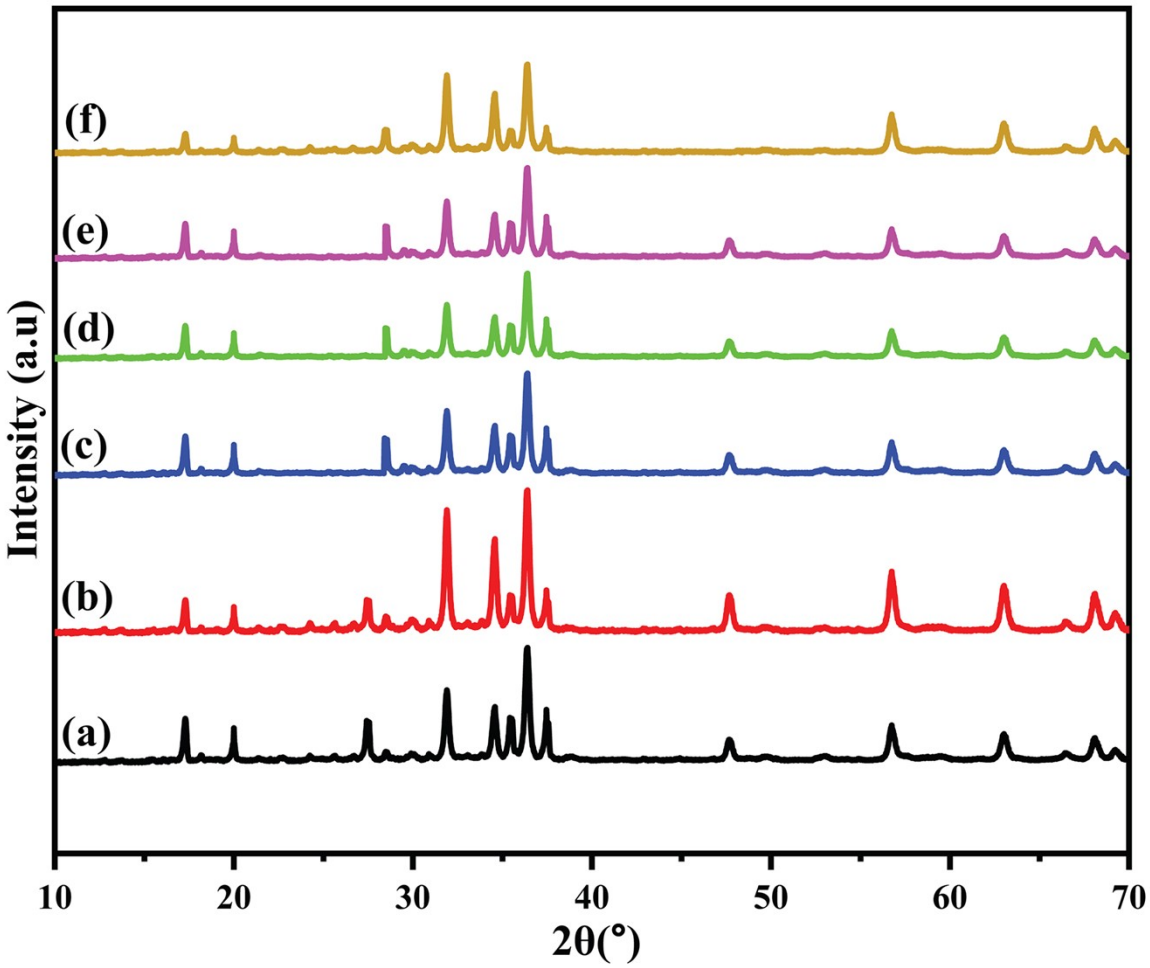

Fig. S2. XRD spectra of ZnO@Co-BDC after (a) 1st cycle (b) 2nd cycle (c) 3rd cycle (d) 4th cycle (e) 5th cycle (f) 6th cycles reusability for degradation of MB.

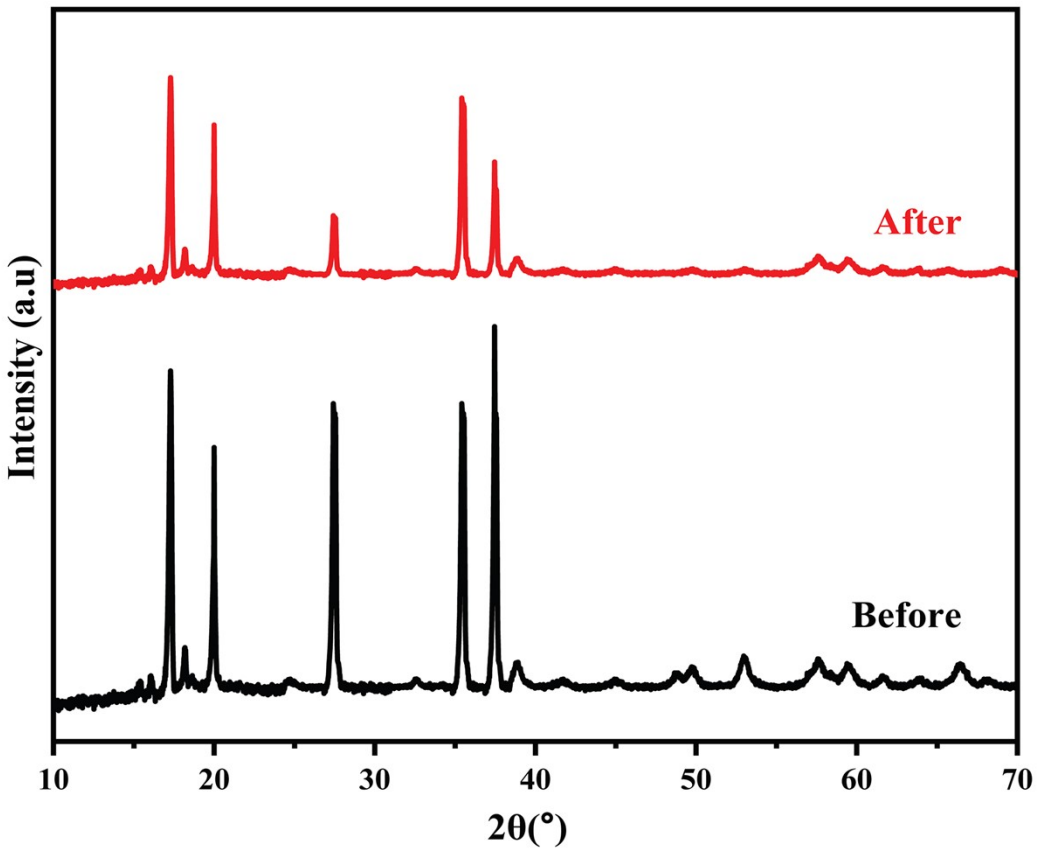

Fig. S3. XRD spectra of Co-BDC before and after used for degradation of MB (1st cycle).

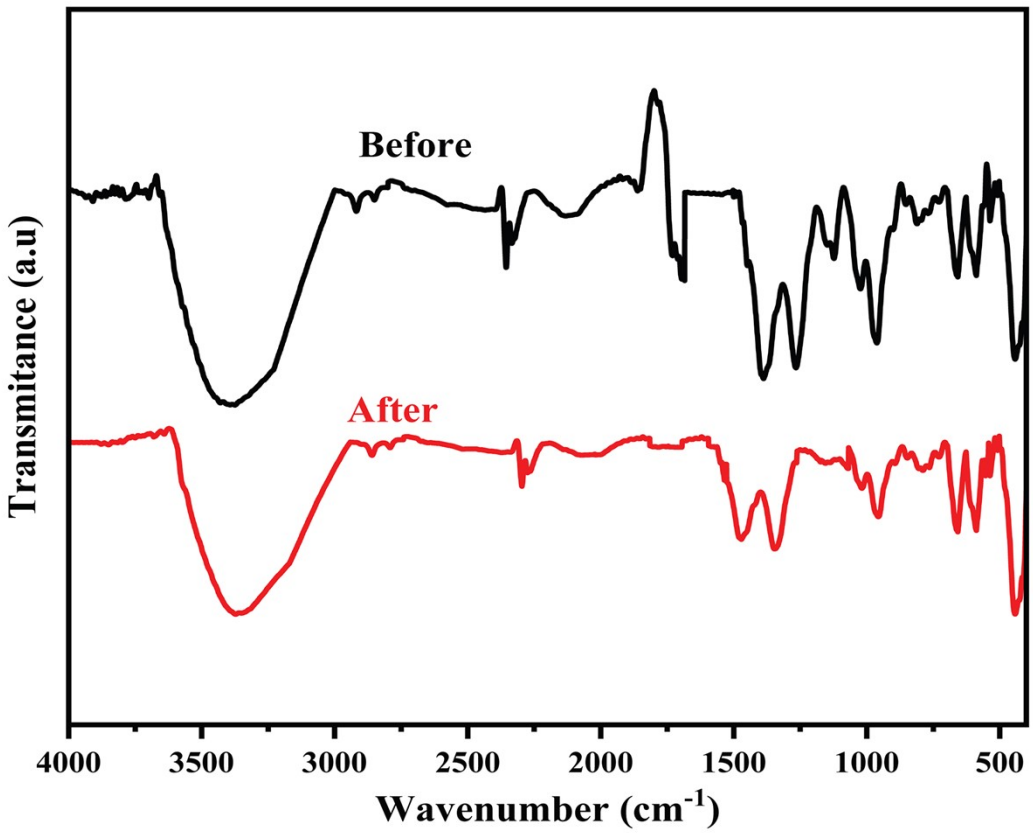

Fig. S4. FTIR spectra of ZnO@Co-BDC composite catalyst before and after used for six cycle degradation of MB (6st cycle).

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