

Supporting Information

ZnO/boron nitride quantum dots nanocomposites for the enhanced photocatalytic degradation of methylene blue and methyl orange

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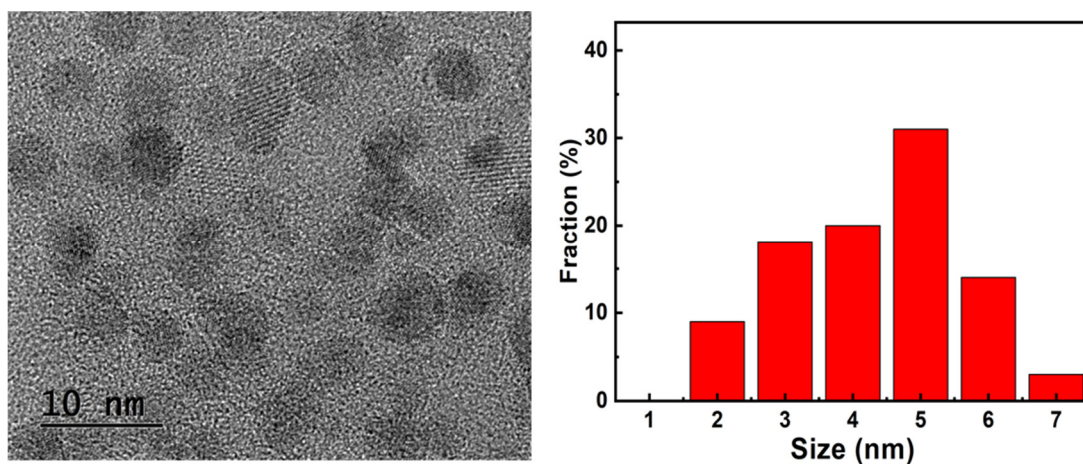


Figure S1. HRTEM image and the size distribution of the synthesized BNQDs.

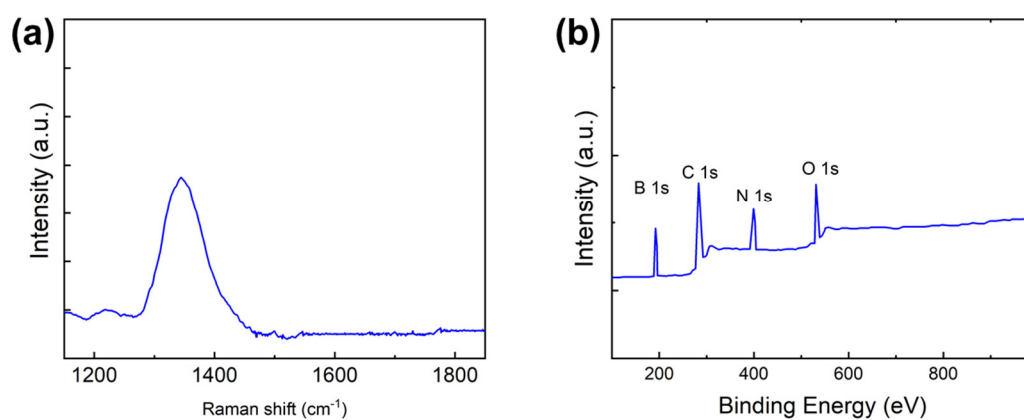


Figure S2. (a) Raman spectrum and (b) XPS survey scan of BNQDs.

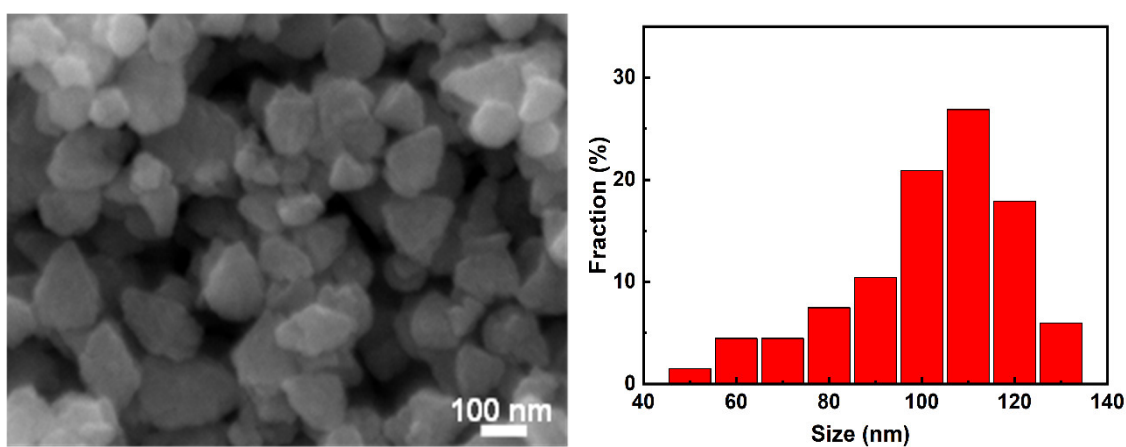


Figure S3. FESEM image and the size distribution of the synthesized ZnO particles.

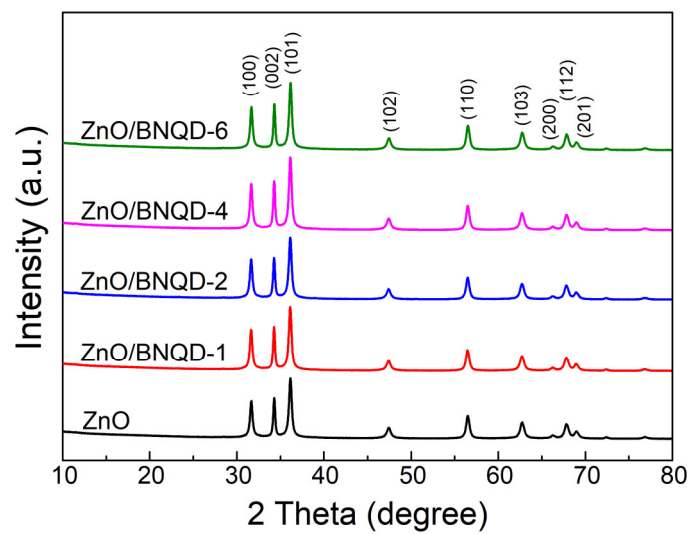


Figure S4. XRD patterns of ZnO and ZnO/BNQD nanocomposites.

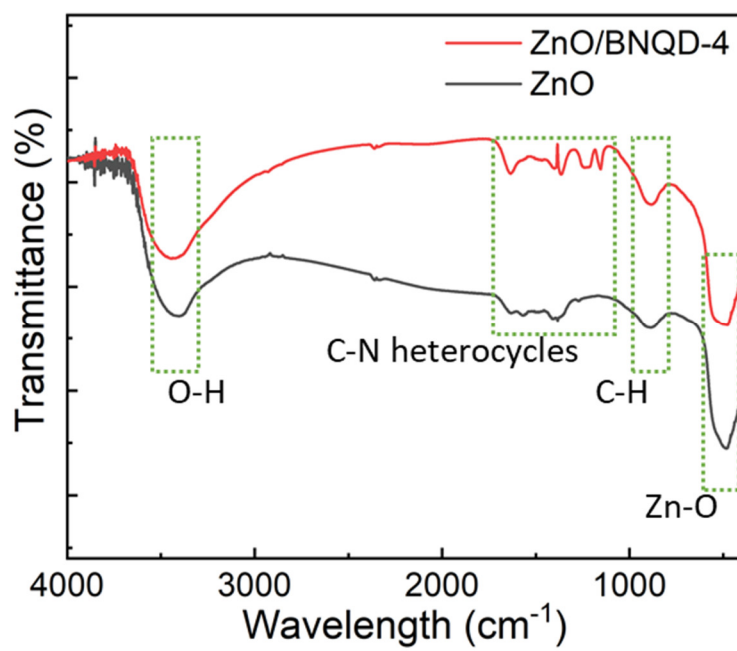


Figure S5. FTIR spectra of ZnO and ZnO/BNQD-4 nanocomposite.

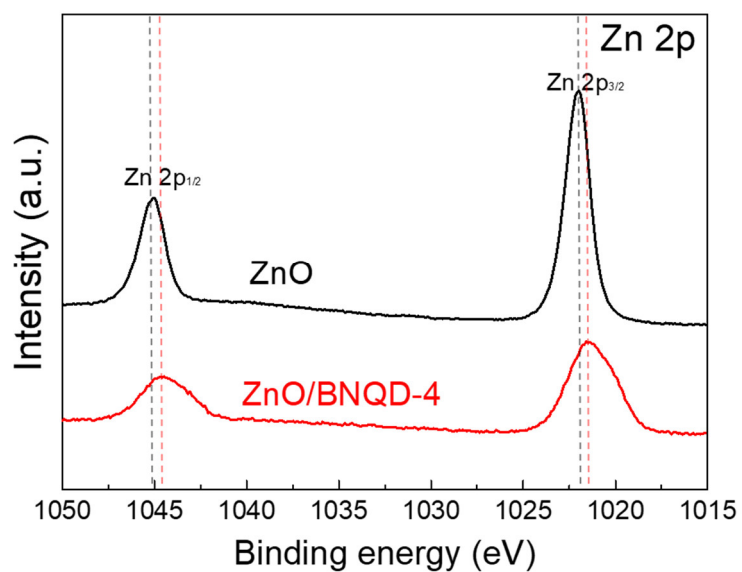


Figure. S6. High resolution XPS spectra of Zn 2p for ZnO and ZnO/BNQD-4 nanocomposite.

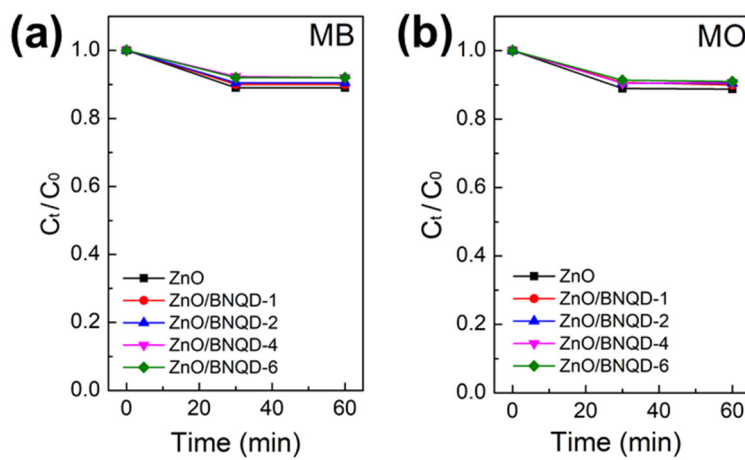


Figure S7. The adsorption equilibrium for ZnO and ZnO/BNQD-4 nanocomposite in (a) MB and (b) MO.

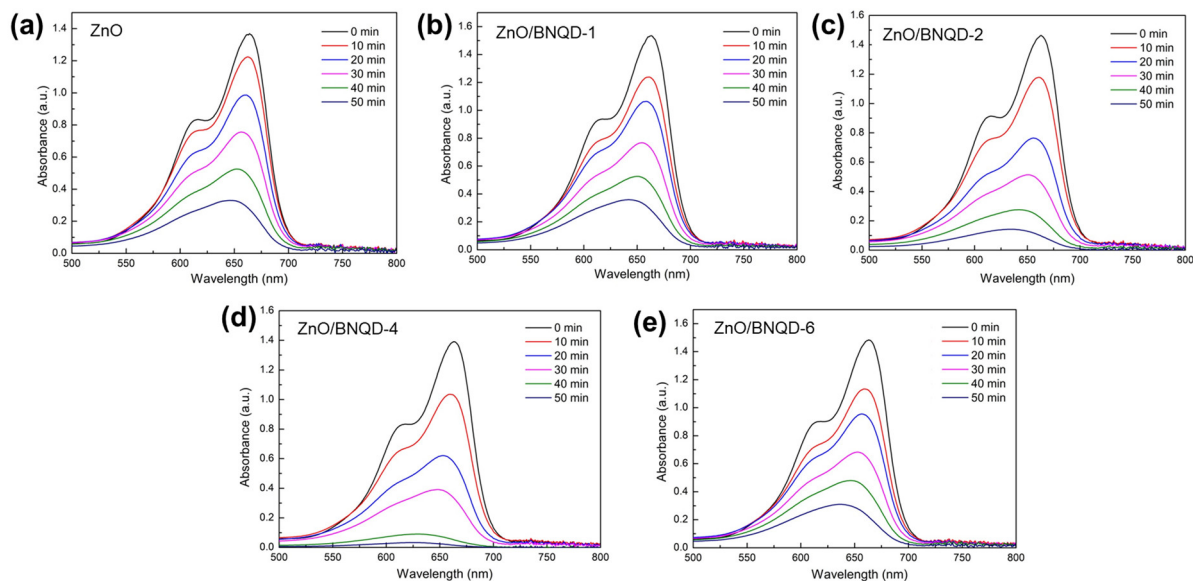


Figure S8. UV-vis spectra of MB solution with (a) ZnO and (b-e) ZnO/BNQD nanocomposites at different irradiation times.

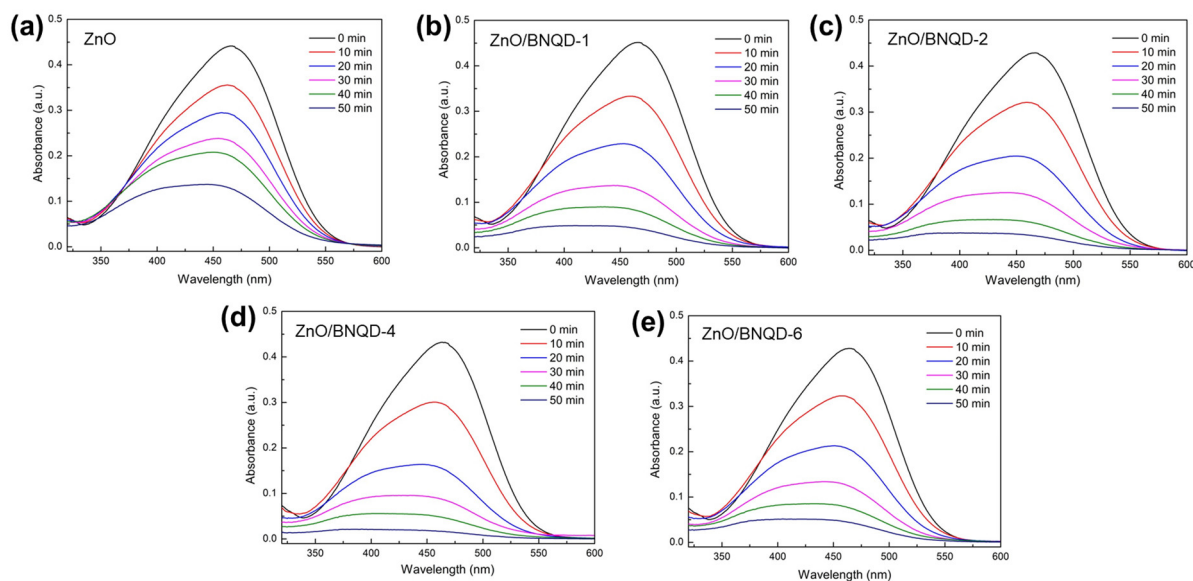


Figure S9. UV-vis spectra of MO solution with (a) ZnO and (b-e) ZnO/BNQD nanocomposites at different irradiation times.

Table S1. Photocatalytic activities comparison for the degradation of MB with ZnO based composites under UV light irradiation.

Sample	Catalyst dosage (g/L)	Light source	Irradiation time	MB degradation (%)	Rate constant (min ⁻¹)	Ref.
N-doped ZnO/C ₃ N ₄	0.5 g/L	300W Xe lamp	100 min	90%	0.0299	[1]
Ag/ZnO	0.6 g/L	6W UV lamp	60 min	87.74%	0.032	[2]
ZnO/Eu	1 g/L	300W Osram Vitalux	150 min	90%	-	[3]
N-ZnO/C ₃ N ₄	1 g/L	300W Xe lamp	90 min	95%	0.030	[4]
AgBr/g-C ₃ N ₄ /ZnO	0.4 g/L	300W Xe lamp	80 min	96.3%	0.041	[5]
N self doped ZnO	0.5 g/L	200W Xe lamp	80 min	95.3%	0.040	[6]
ZnO/BNQD	1 g/L	20W Sigma 4 BLB	40 min	96.4%	0.0776	This work

Table S2. Photocatalytic activities comparison for the degradation of MO with ZnO based composites under UV light irradiation.

Sample	Catalyst dosage (g/L)	Light source	Irradiation time	MO degradation (%)	Rate constant (min ⁻¹)	Ref.
ZnO/Eu	1.0 g/L	300 W Osram Vitalux	60 min	95%	-	[3]
Graphene/ZnO	0.5 g/L	Natural sunlight	150 min	100%	0.035	[7]
Ag-N-ZnO	0.2 g/L	500 W Xe lamp	120 min	98.82%	0.026	[8]
ZnO/SnO ₂	0.2 g/L	300 W Hg lamp	100 min	56%	-	[9]
Cu-TiO ₂ /ZnO	1.0 g/L	500 W Xe lamp	60 min	83%	0.0306	[10]
ZnO/g-C ₃ N ₄	2.5 g/L	500 W Xe lamp	120 min	98%	0.136	[11]
ZnO/BNQD	1.0 g/L	20W Sigma 4 BLB	50 min	97.9%	0.0666	This work

References

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