

Degradation or Adsorption? Revisiting Organic Dye Removal by Two Morphologies of InVO_4

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Supporting Information.

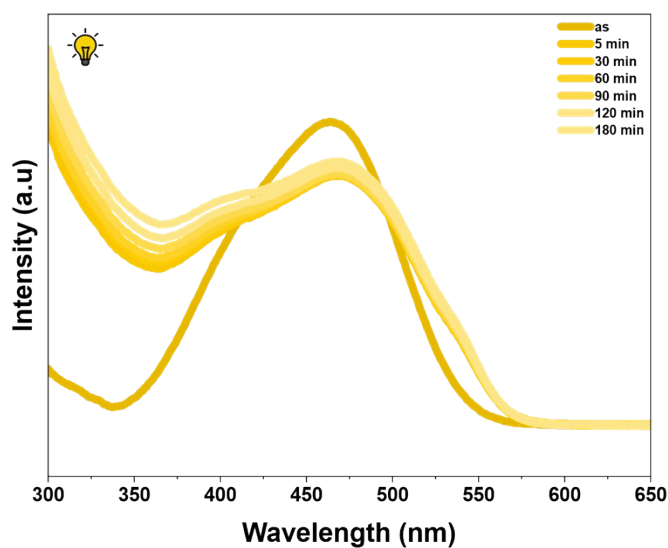


Figure S 1. Methyl Orange removal under light irradiation, using the IVO-R sample at different time intervals (IVO-R dosage: 0.1 g L^{-1} , dye concentration 5 mg L^{-1}).

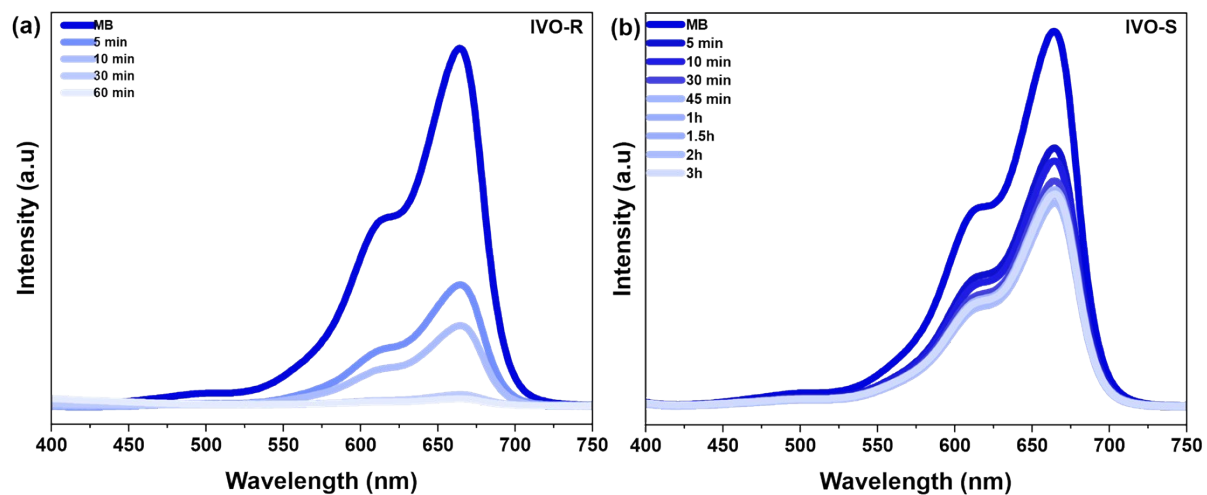


Figure S 2. Adsorption of MB dyes using (a) IVO-R and (b) IVO-S (adsorbent dosage: 0.1 g L⁻¹, MB concentration: 5 mg L⁻¹, experiment time 3h).

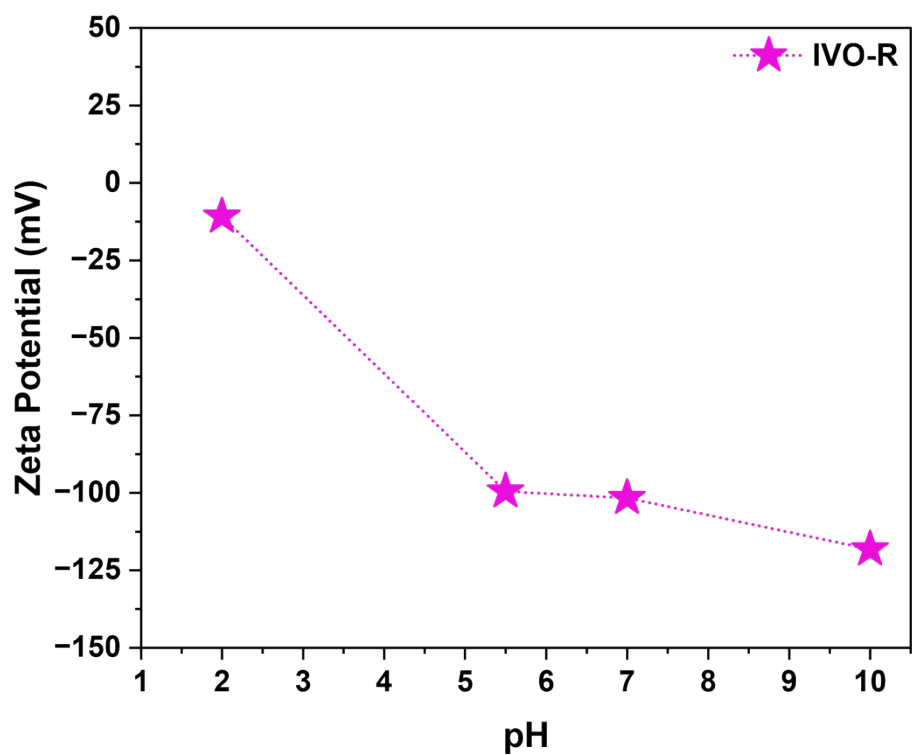


Figure S 3. Zeta Potential of IVO-R sample at different pH values and zeta potential of MB.

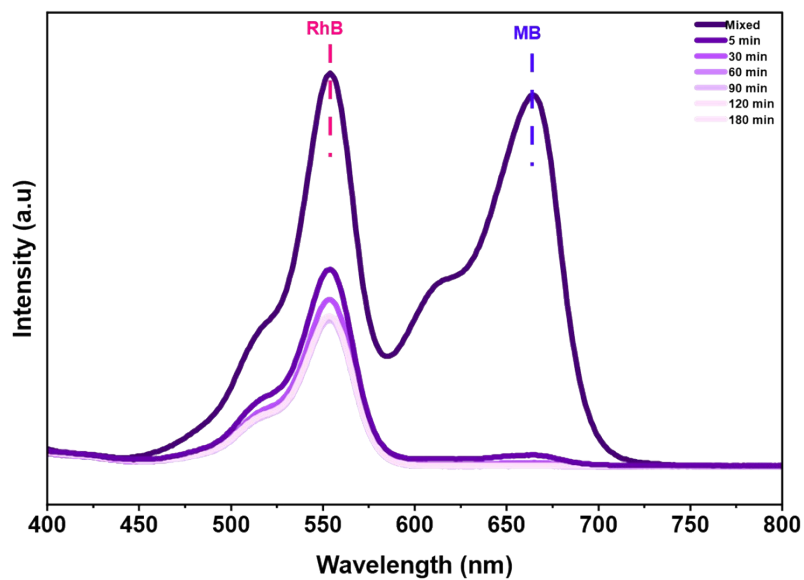


Figure S 4. Adsorption of mixed RhB/MB, using the IVO-R sample at different time intervals (IVO-R dosage: 0.15 g L⁻¹, dye concentration 40 mg L⁻¹).

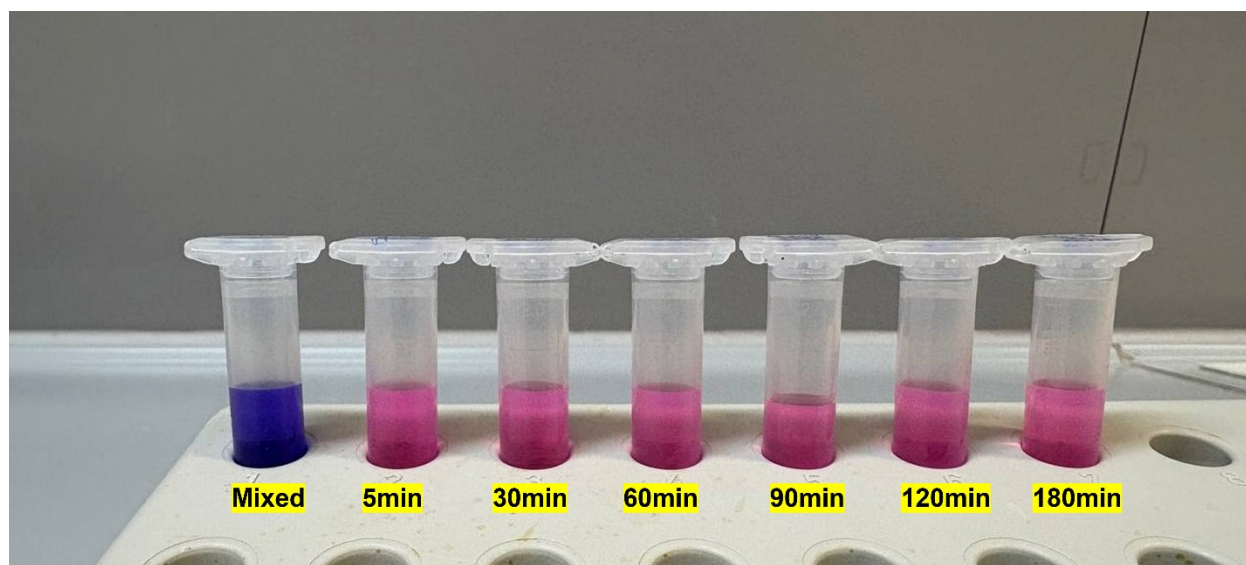
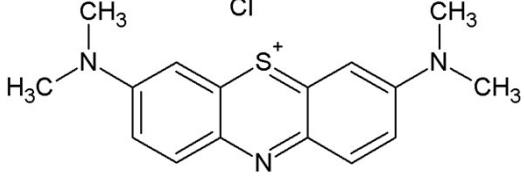
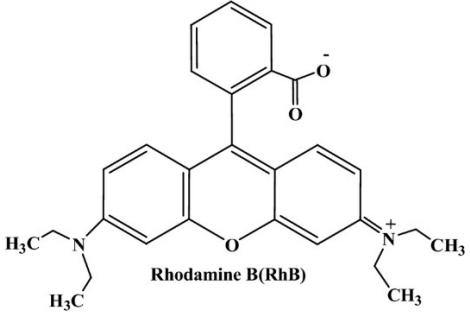
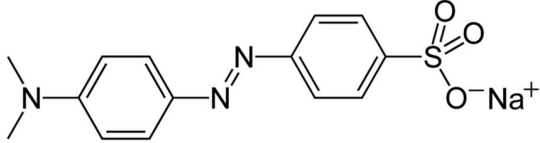


Figure S 5. Adsorption of mixed RhB/MB (1:1, 40 mg L⁻¹) by the IVO-R sample (adsorbent dosage: 0.15 g L⁻¹).

Table S 1. Structural and chemical characteristics of MB, RhB and MO dyes used in this study. ¹⁻³

Dye Name	Chemical Formula	Dye Type	Structural Class	Molecular Structure
Methylene Blue	$C_{16}H_{18}C_1N_3S$	Basic	Phenothiazine	
Rhodamine B	$C_{28}H_{31}C_1N_2O_3$	Basic	Xanthene	
Methyl Orange	$C_{14}H_{14}N_3NaO_3S$	Acid	Azo	

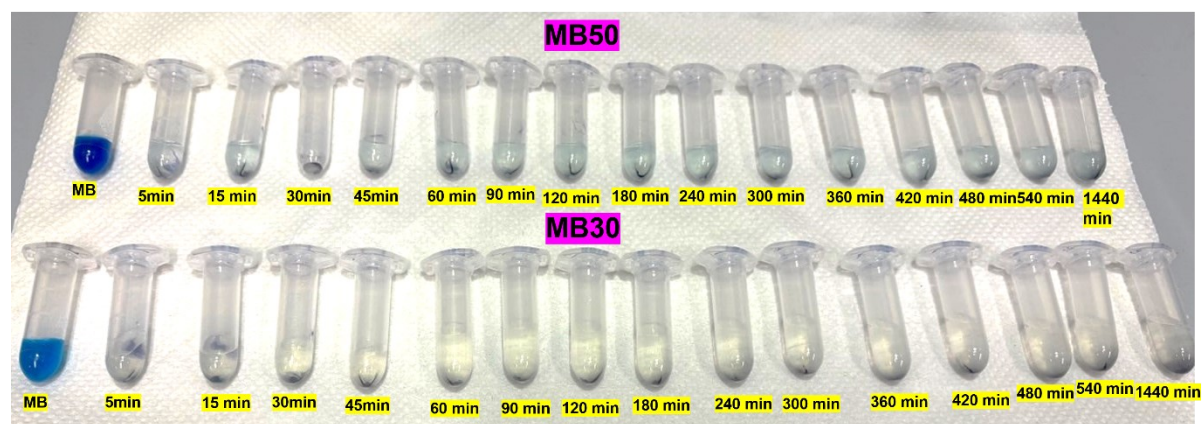


Figure S 6. Adsorption of MB by the IVO-R sample at two different initial MB concentrations (30 and 50 g L⁻¹) for the adsorption kinetics study.

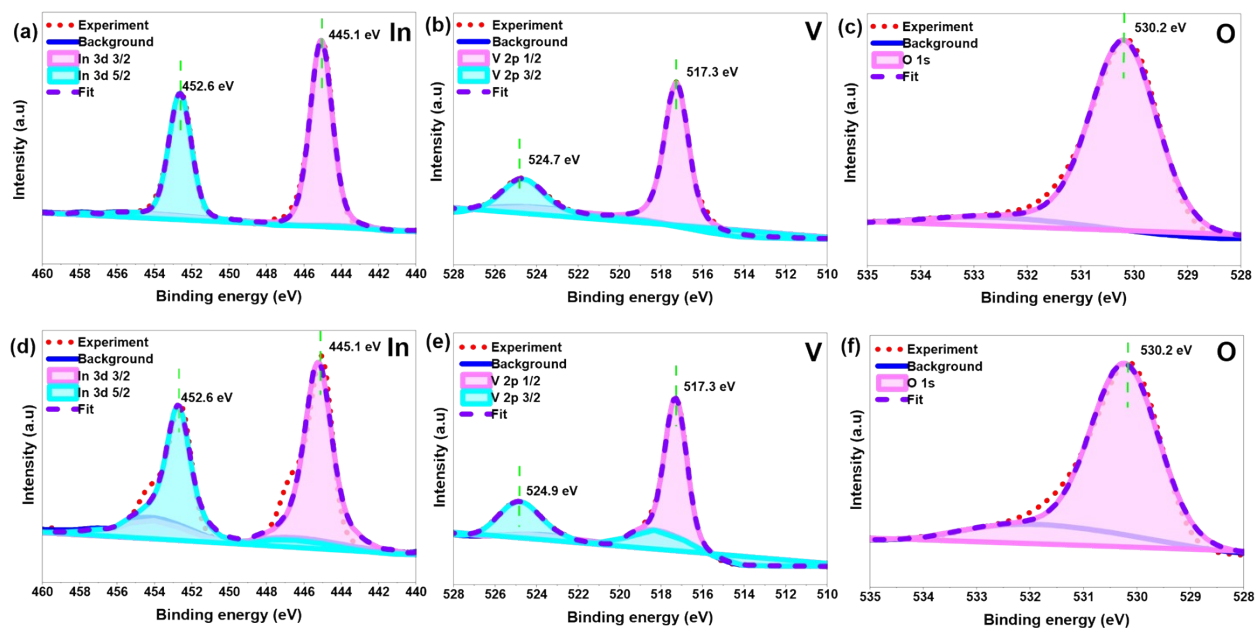


Figure S 7. XPS analysis of (a-c) IVO-R and (d-f) IVO-R after adsorption.

Table S 2. Comparison of Methylene Blue adsorption capacity of different adsorbents.

Absorbent	Adsorption Capacity ($\text{mg} \cdot \text{g}^{-1}$)	Reference
InVO₄	290	Present Study
Carbon Nanotubes	35.4- 64.7	4
Activated Carbon	435	5
Rice Husk	40.58	6
Graphene	153.85	7
Fe₃O₄@ MIL-100 (Fe)	49.41	8
MnFe₂O₄	44.90	9
MnOx @ cotton fibers	46.30	10

Reference

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