

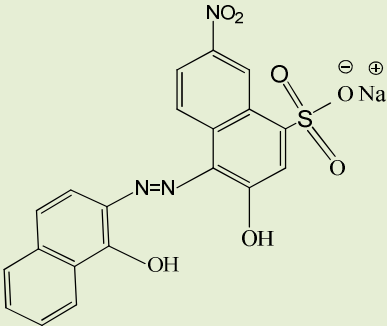
Supplementary Materials: Solochrome Dark Blue Azo Dye Removal by Sonophotocatalysis Using Mn²⁺doped ZnS Quantum Dots

Jyoti Patel ¹, Ajaya K. Singh ^{1,*}, Bhawana Jain ¹, Sushma Yadav ¹, S  nia A. C. Carabineiro ² and Md. Abu Bin Hasan Susan ³

Table S1. Kinetic parameters: rate constants (*k*), correlation coefficients (*R*²) and decolorization efficiency (DE) for the removal of Solochrome dark blue dye by Mn²⁺:ZnS Qds.

Conditions	<i>q_e</i>	Rate Constant (<i>k</i> , g mg ⁻¹ min ⁻¹)	<i>R</i> ²	DE (%)
Pure ZnS Qds + UV light	12.82	1.4 ×10 ⁻²	0.98	46.6
Mn ²⁺ :ZnS Qds + UV light	15.15	1.26 ×10 ⁻²	0.98	55.22
Pure ZnS Qds + Ultrasound	17.85	5.2 ×10 ⁻³	0.94	62.37
Mn ²⁺ :ZnS Qds + Ultrasound	19.60	5.9 ×10 ⁻³	0.96	69.7
Pure ZnS Qds + UV light + Ultrasound	21.27	5.0 ×10 ⁻³	0.95	76.06
Mn ²⁺ :ZnS Qds + UV light + Ultrasound	25	3.97 ×10 ⁻³	0.95	89

Table S2. Data for Solochrome dark blue dye.

Structure	Molecular weight	λ _{max}	Molecular formula
	461.381 g/mol	560 nm	C ₂₀ H ₁₂ N ₃ O ₇ Na

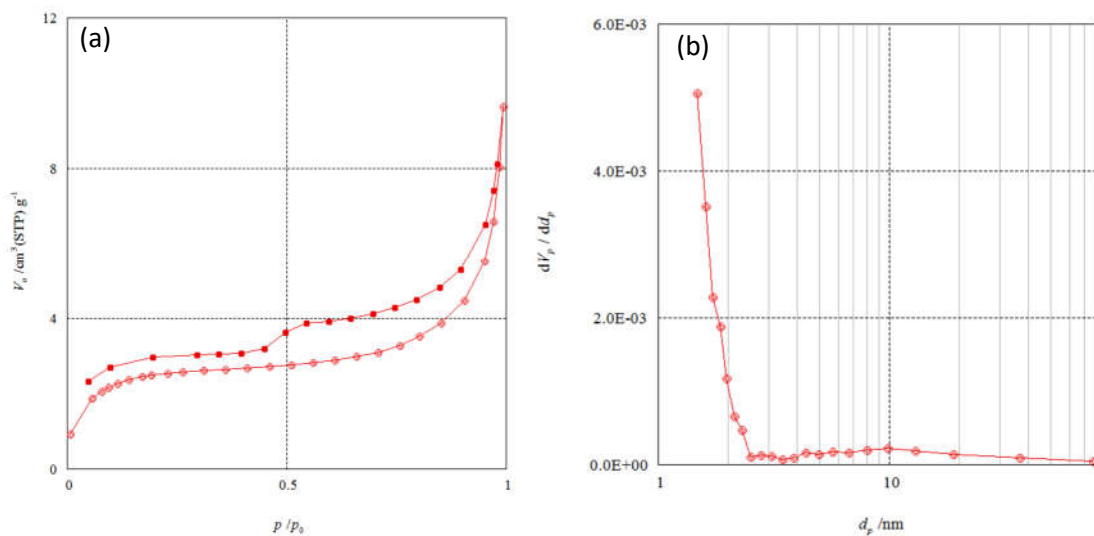


Figure S1. (a) N_2 adsorption-desorption isotherms of $Mn^{2+}:ZnS$ Qds. (b) Pore size distribution obtained by BJH-adsorption.

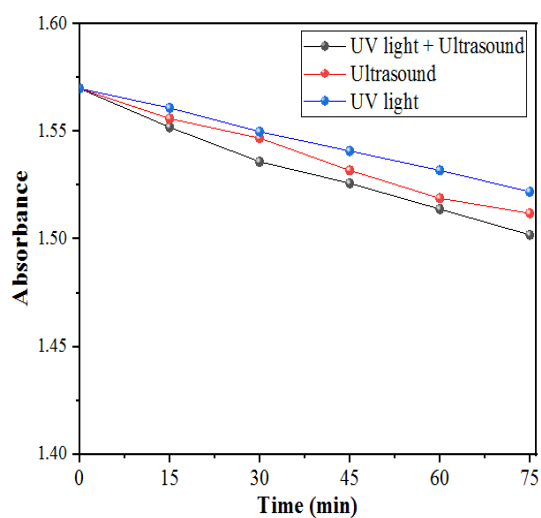


Figure S2. SDB absorbance changes at absorption maximum ($\lambda_{max} = 560$ nm) for the ultrasound and UV light assisted degradation in the absence of pure and doped $Mn^{2+}:ZnS$ Qds at optimum conditions (15 mL of 70 ppm SDB, pH 6, 75 min ultrasound and/or UV light irradiation).

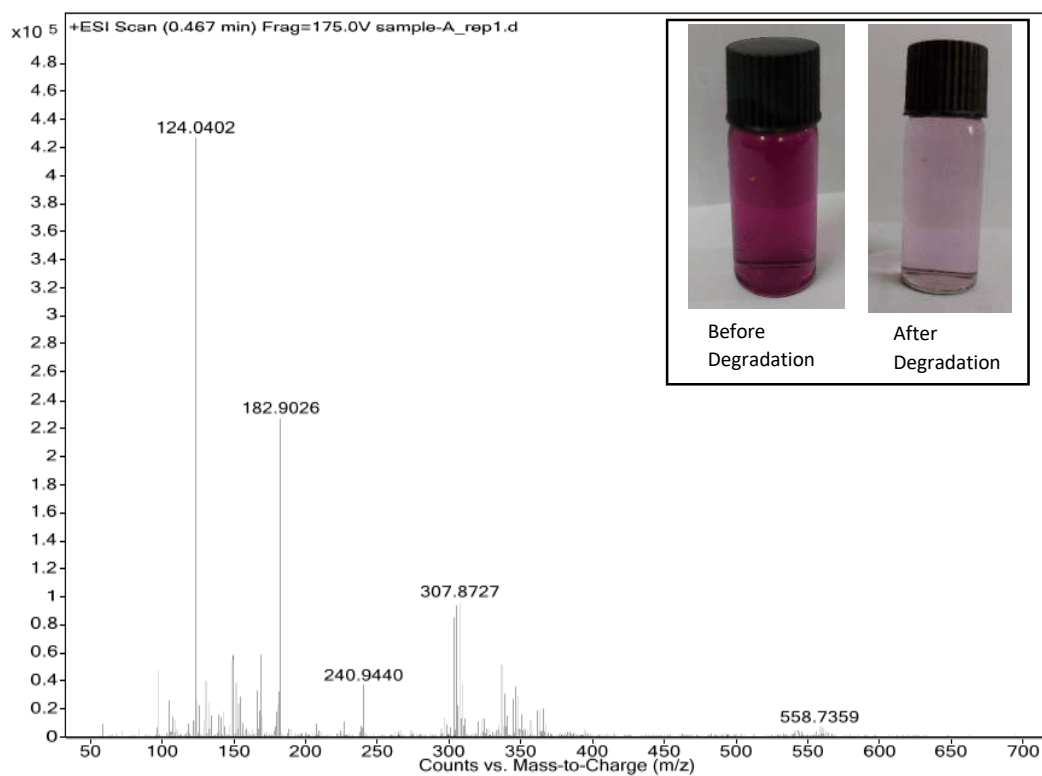


Figure S3. LC–MS of Mn^{2+} doped ZnS assisted photodegraded SDB solution. Inset: SDB solution before and after degradation (after 75 mins).

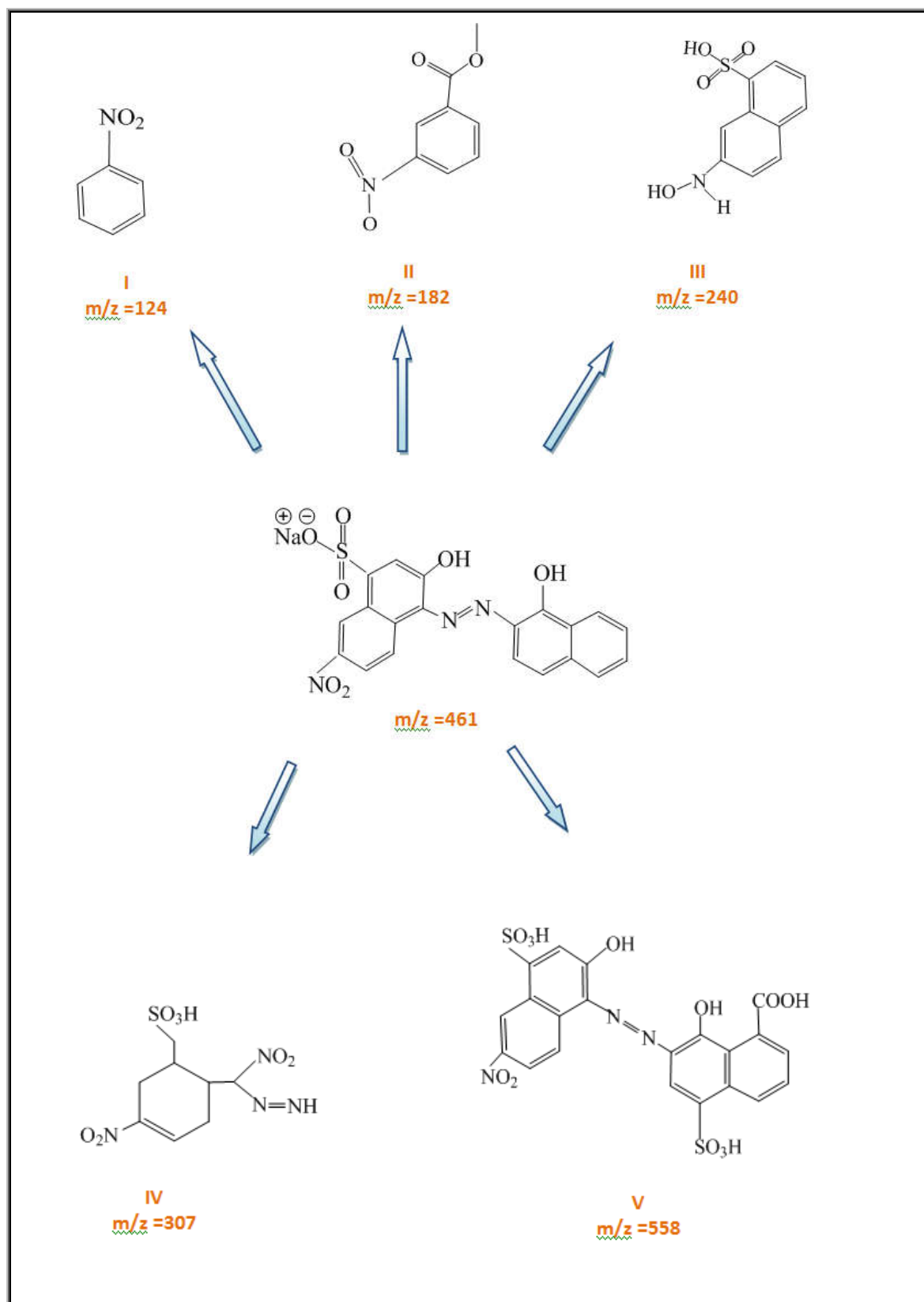


Figure S4. Degradation products of SDB photodegradation catalyzed by Mn^{2+} :ZnS Qds.

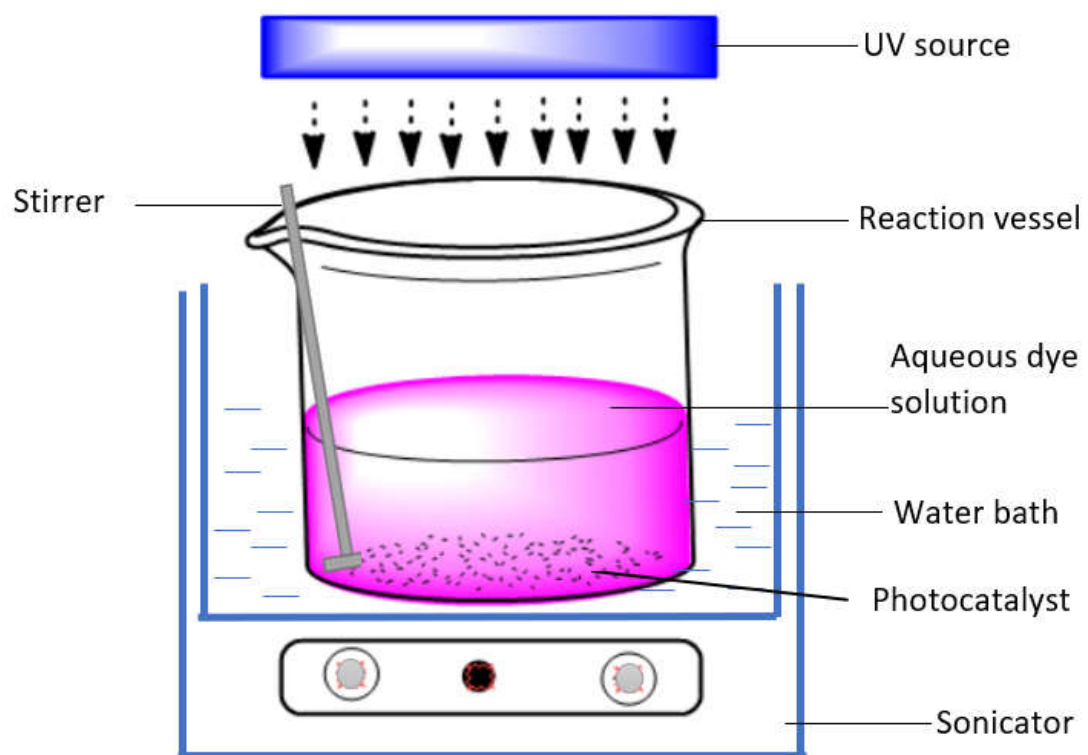


Figure S5. Schematic diagram of sonophotocatalytic experimental setup