

Supplementary material

Solar-driven advanced oxidation processes for full mineralisation of azo dyes in wastewater

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A. The UV-vis spectra of methyl orange solution at different temperatures

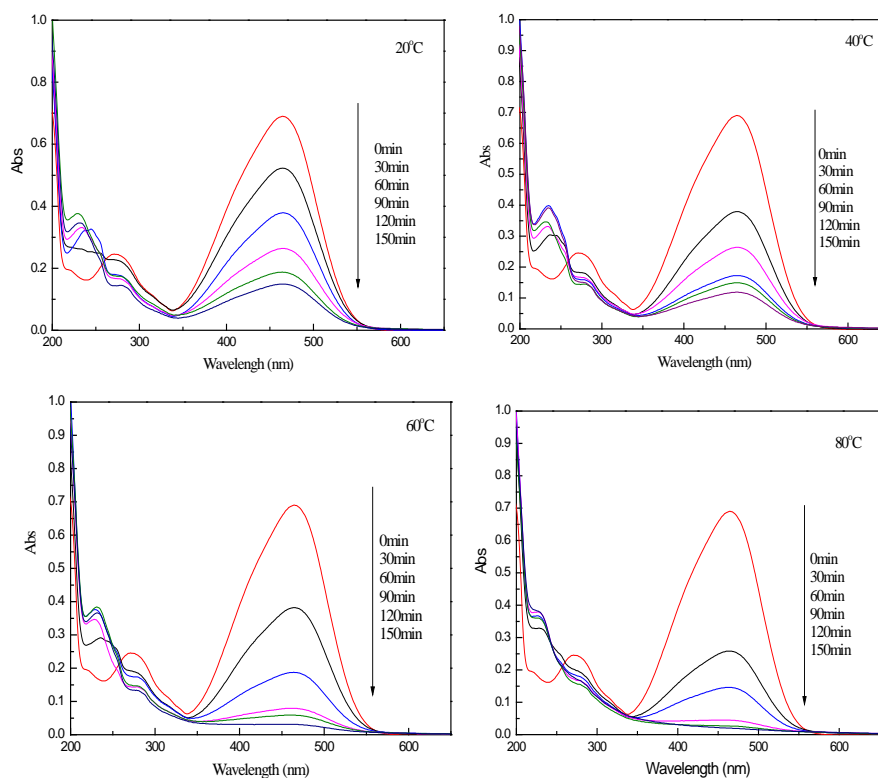


Fig. S1. Time-dependent UV spectra of methyl orange at different temperatures.

B. Theoretical calculation of STEP-AOPs oxidation of methyl orange

Table S1. Calculated Gibbs free energy and electrochemical potential

Temperature (K)	293	313	333	353
$\Delta_r G_m^\circ$ (kJ mol ⁻¹)	9246(7635)	9209(7581)	9172 (7528)	9134(7474)
E_T (V)	1.11(0.920)	1.11(0.914)	1.11 (0.907)	1.10 (0.901)

Note: The values in parentheses are the free energies calculated at the B3LYP/6-31G(d) level of theory corrected for solvation effects calculated using SMD continuum model at the B3LYP/6-31G(d) level of theory with water as the solvent.

C. The reaction rate at different temperatures

Table S2. Degradation rate at different temperatures

Time (min)	Reaction rate (mg L ⁻¹ min ⁻¹)			
	20°C	40°C	60°C	80°C
0	0.811	1.51	1.547	2.10
30	0.865	1.04	1.22	1.32
60	0.675	0.504	0.713	0.519
90	0.324	0.280	0.314	0.290
120	0.235	0.129	0.117	0.0608
150	0.256	0.146	0.136	0.0341