

Supporting information

Equilibrium and kinetic studies on MB adsorption by ultrathin 2D MoS₂ nanosheets

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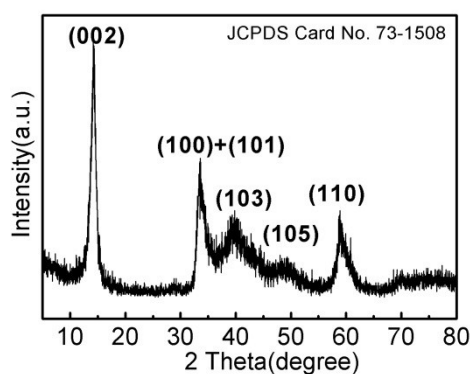


Fig. S1 XRD pattern of MoS₂ obtained at 220°C

Table S1 Comparison for MB adsorption capacities of different adsorbents.

Adsorbent	Adsorption capacities (mg g ⁻¹)	References
MCGO	95.16	[1]
GO	43.5	[1]
Activated charcoal	25.25	[2]
Graphene	50	[3]
Polydopaminemicrospheres	90.7	[4]
PZS nanotubes	69.16	[5]
MoS ₂ nanosheets	146.43	This work

References

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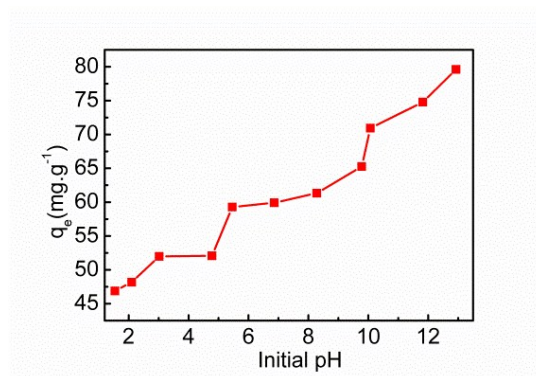


Fig.S2 Effects of initial pH on the adsorption of MB onto the MoS₂ nanosheets.

Table S2 Kinetic parameters for the adsorption of MB onto MoS₂ nanosheets at 298K.

	$Q_{e,exp}(\text{mg g}^{-1})$	Pseudo-first-order			Pseudo-second-order		
		$k_1(\text{sec}^{-1})$	$Q_{e,cal}(\text{mg g}^{-1})$	R^2	$k_2(\text{g mg}^{-1}\text{sec}^{-1})$	$Q_{e,cal}(\text{mg g}^{-1})$	R^2
10	39.52	0.0097	60.45	0.9120	0.0043	40.45	0.9998
20	78.31	0.0037	50.86	0.9549	0.0008	82.30	0.9997
30	112.52	0.0035	75.03	0.9527	0.0005	118.62	0.9997
40	146.43	0.0029	68.93	0.9385	0.0006	151.75	0.9999

Table S3 Intraparticle diffusion parameters for the adsorption of MB onto MoS₂ nanosheets at 298K.

C_0	$k_{i,1}$	C_1	R^2	$k_{i,2}$	C_2	R^2	$k_{i,3}$	C_3	R^2
(mg L ⁻¹)	(mg g ⁻¹ sec ^{1/2})	(mg g ⁻¹)		(mg g ⁻¹ sec ^{1/2})	(mg g ⁻¹)		(mg g ⁻¹ sec ^{1/2})	(mg g ⁻¹)	
10	6.39	0	1	0.86	29.95	0.8344	0.06	38.44	0.7155
20	10.49	0	1	2.89	42.75	0.8634	0.73	65.96	0.8291
30	14.71	0	1	4.16	59.46	0.8567	1.35	89.79	0.8111
40	21.32	0	1	4.16	93.06	0.9217	1.34	123.73	0.8497

Table S4 Isotherm parameters for the adsorption of MB onto MoS₂ nanosheets at 298K.

Langmuir			Freundlich		
$b(\text{L mg}^{-1})$	$q_m(\text{mg g}^{-1})$	R^2	K_f	n	R^2
2.52	151.86	0.9780	94.64	2.88	0.9798