Electronic Supplementary Material (ESI) for Environmental Science: Advances.

Starch based sustainable bio-hybrid composite for surface assimilation of methylene blue: Preparation, characterization, and adsorption study

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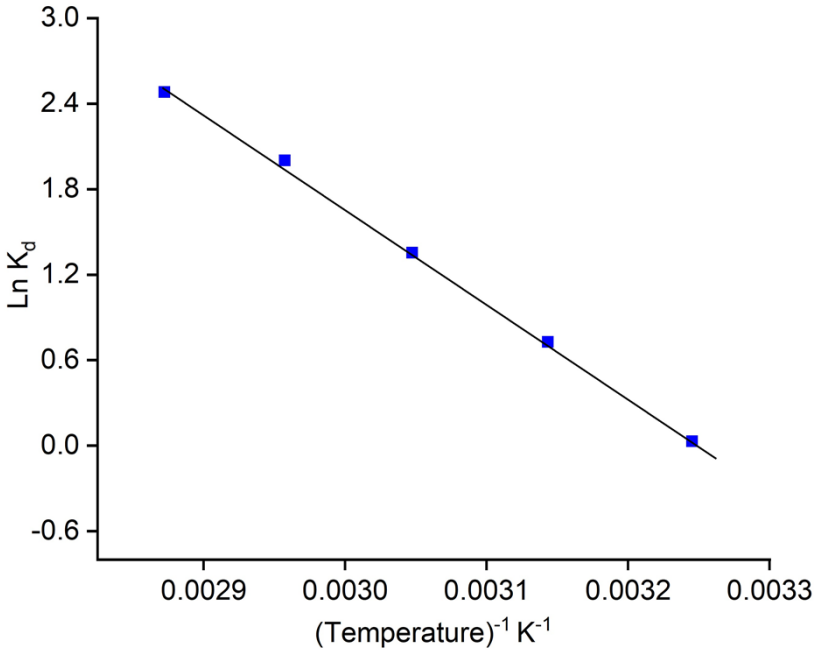

Fig. S1. Effect of temperature on the adsorption of methylene blue on starch-halloysite nanotubes (HNT) composite flakes.

Table S1. Thermogravimetric data for starch-HNT composite flakes

System	Temperature (℃)			
	5 % weight loss	50 % weight loss	75 % weight loss	Residual mass at 600 ℃ (% weight)
Starch	60	313	322	7.9
Halloysite nanotubes (HNT)	412	-	-	84.5
Starch-HNT Flakes (Composite)	82	315	-	28.6
Methylene blue adsorbed composite	118	313	364	13.2

Table S2. Thermodynamic parameters for adsorption of methylene blue on Starch-HNT composite flakes.

Temperature (K)	ΔG^0 (kJ mol^{-1})	ΔH^0 (kJ mol^{-1})	ΔS^0 (kJ $mol^{-1}K^{-1}$)
308.15	-0.816 ± 0.017	58.35	0.192
318.15	-2.735 ± 0.040		
328.15	-4.655 ± 0.081		
338.15	-6.574 ± 0.113		
348.15	-8.495 ± 0.165		