

Adsorption behavior of magnetic amino-functionalized metal-organic
framework for cationic and anionic dyes from aqueous solution

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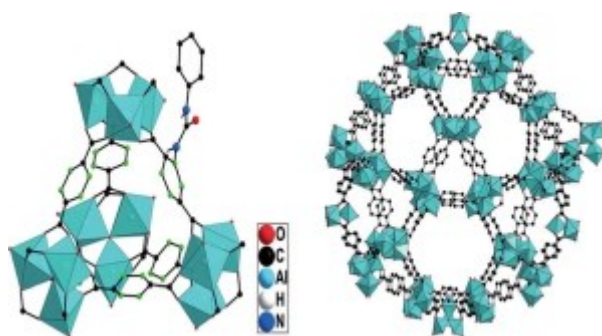
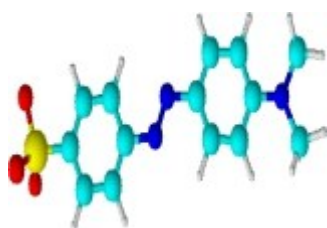
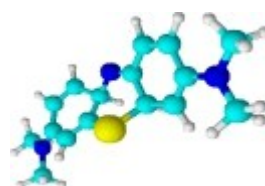


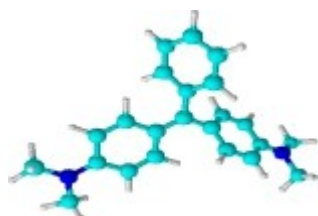
Fig. S1. The structure of MIL-101.¹



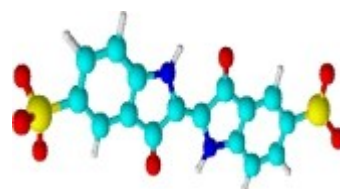
Methyl Orange



Methylene Blue



Malachite Green



Indigo Carmine

Fig. S2. The structures of four different dyes

Table S1. The existing form and distribution curve of these dyes under different pH conditions

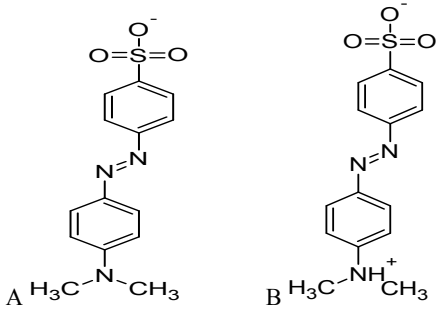
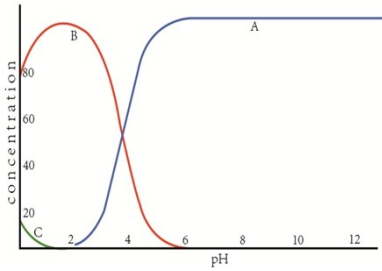
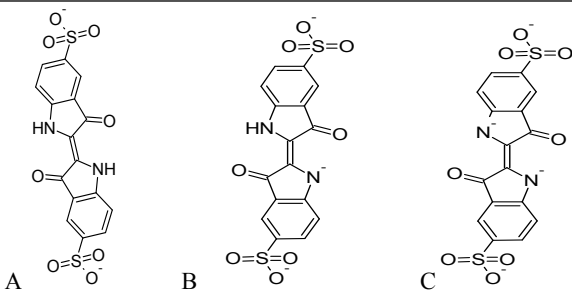
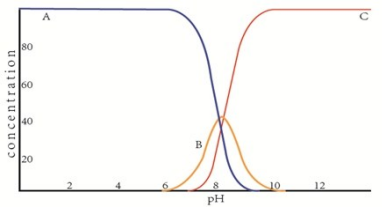
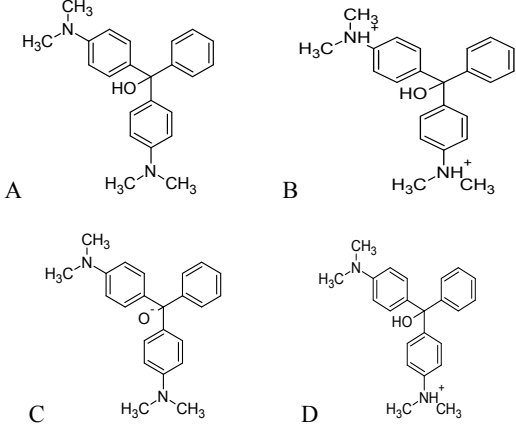
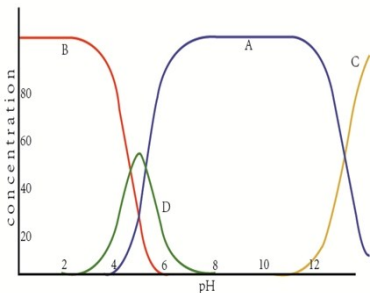
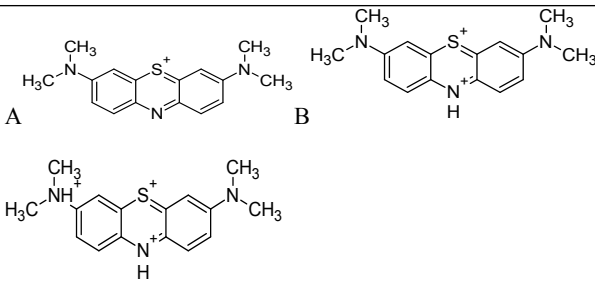
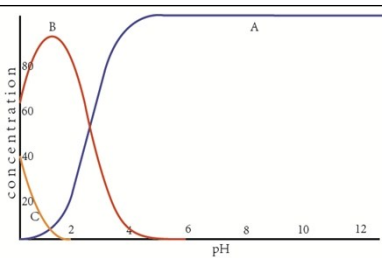
		Main existing forms	Distribution curve
Anionic dyes	MO	 <p>A $\text{H}_3\text{C}-\text{N}(\text{CH}_3)_2$ B $\text{H}_3\text{C}-\text{NH}^+(\text{CH}_3)_2$</p>	
	IC	 <p>A B C</p>	
Cationic dyes	MG	 <p>A B C D</p>	
	MB	 <p>A B C</p>	

Table S2. The maximum adsorbance wavelength, molecular size, logP of the four dyes

Dyes	Maximum adsorbance wavelength (nm)	Molecular size (Å×Å ×Å)	logP
Methyl orange	463	5.31×7.25×17.39	2.61
Methylene blue	664	16.75×8.01×4.58	2.61
Malachite green	617	13.8×9.9×4.2	4.85
Indigo carmine	610	11.21×1.63×7.94	1.01

Note: the molecular size is measured by ChemBioDraw along the direction of the two sulfonic groups.

Reference

1. T. Wittmann, R. Siegel, N. Reimer, W. Milius, N. Stock and J. Senker, *Chem. -Eur. J.*, 2015, **21**, 314-323.