Supplementary Material (ESI) for Chemical Communications

Electronic Supplementary Informations

For

"Everything is surface": Tunable Polymer organic frameworks with ultrahigh dye sorption capacity†

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Materials and methods

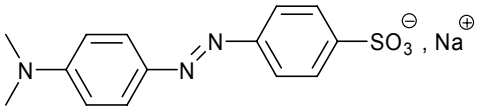
Methyl Orange, Methylene blue, Reactive blue 2, Yellow 3G-P where purchased from Aldrich and used as received. UV measurements where carried out with a Perkin-Elmer Lambda 2 spectrophotometer. Nitrogen sorption measurements were collected on a Quantachrome Quadrasorb apparatus at 77K. BET surface areas were determined over the P/P_0 range as described.[1] The samples were degassed at 200°C for 15h before measurements. NLDFT pore size distributions were determined using the carbon/slit-cylindrical pore model of the Quadrawin software.

In a typical experiment, 1,4-dicyanobenzene or 4,4'-dicyanobiphenyl (1.00 g) and the corresponding amount of $ZnCl_2$ were transferred into a quartz ampoule (3x12cm) under an inert atmosphere. The ampoule was evacuated, sealed and heated to the desired temperature for different times. The ampoule was then cooled down to room temperature and opened. **Caution:** for temperatures higher than 500°C the ampoules are under pressure, which is released during opening. The reaction mixture was subsequently grounded and then washed thoroughly with water to remove most of the $ZnCl_2$. Further stirring in diluted HCl for 15 h was carried out to remove the residual salt. After this purification step, the resulting black powder was filtered, washed successively with water and THF and dried in vacuum at 150°C. Typical isolated yield: 90%.

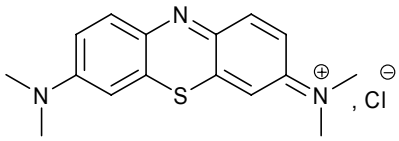
BP was synthesized from the polymerization of 4,4'-dicyanobiphenyl in 10 equiv. of $ZnCl_2$, for 20 h at 400°C and 20 h at 600°C as described previously.[2] **DCB1** was prepared from the polymerization of 1,4-dicyanobenzene in 5 equiv. of $ZnCl_2$ during 20 h at 600°C as previously reported.[3] **DCB2** was prepared from the polymerization of 1,4-dicyanobenzene in 5 equiv. of $ZnCl_2$ for 20 h at 400°C and 96 h at 600°C.[3]

Equilibrium adsorption isotherms were undertaken at 25°C. A mass of 20 mg of adsorbent was stirred during 24h in 10 mL of dye solutions of various concentrations in distilled water. After decantation, the supernatant solution was subjected to UV measurements. The absorbance was determined in all cases at the wavelength of maximum absorption. Dilutions were carried out if necessary.

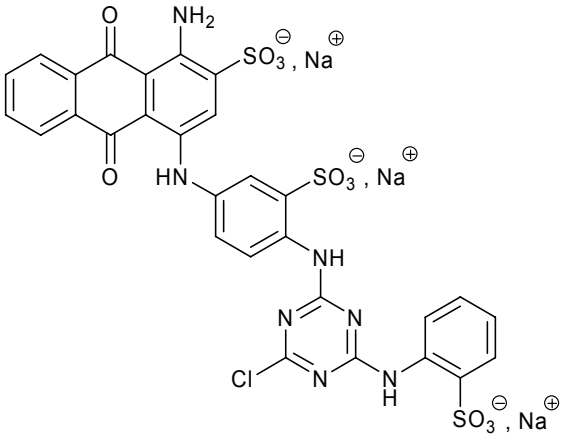
Figure S1. Molecular structure of the different dyes used in this study



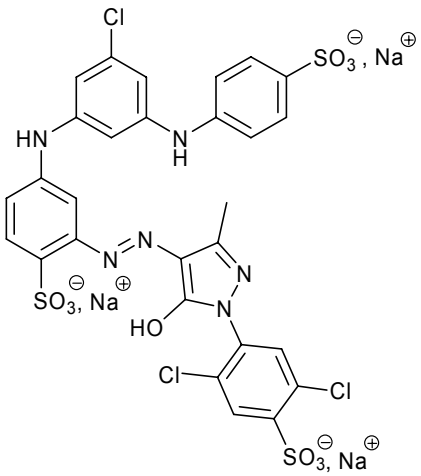
Methyl organge



Methylene Blue



Reactive Blue 2



Yellow 3G-P

References

1. K. S. Walton and R. Q. Snurr, *J. Am. Chem. Soc.*, 2007, **129**, 8552– 8556.
2. P. Kuhn, A. forget, J. Hartmann, A. Thomas and M. Antonietti, *submitted*, 2008.
3. P. Kuhn, A. Forget, D. Su, A. Thomas and M. Antonietti, *J. Am. Chem. Soc. in press*, 2008.