Electronic Supplementary Material (ESI) for RSC Advances.

Support Information

Bio-Inspired Adhesion: Fabrication and Evaluation of Molecularly Imprinted Nanocomposite Membranes by Developing A "Bio-Glue" Imprinted Methodology

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Experimental Details

Detailed test conditions of HPLC

The solvent of samples was volatilized under vacuum and then methanol (HPLC grade) was applied to dissolve the dry samples. The conditions of determination were as follows: methanol/H_2O (70/30, v/v) mobile phase, 1.0 mL min^{-1} flow rate, 280 nm UV detection and 25 ^oC column temperature.

Adsorption regeneration experiments

To investigate the regeneration and stability character of MINCMs, the regenerate adsorption experiments were performed at the concentration of 600 mg L^{-1} for five times by the same adsorbed membrane. After adsorption, the saturated adsorbed MINCMs were eluted with the mixture of methanol and acetic acid (95:5, v/v) by Soxhlet extraction to remove the template molecules. And then the regenerated MINCMs were used for subsequent adsorption cycles (adsorption-desorption).

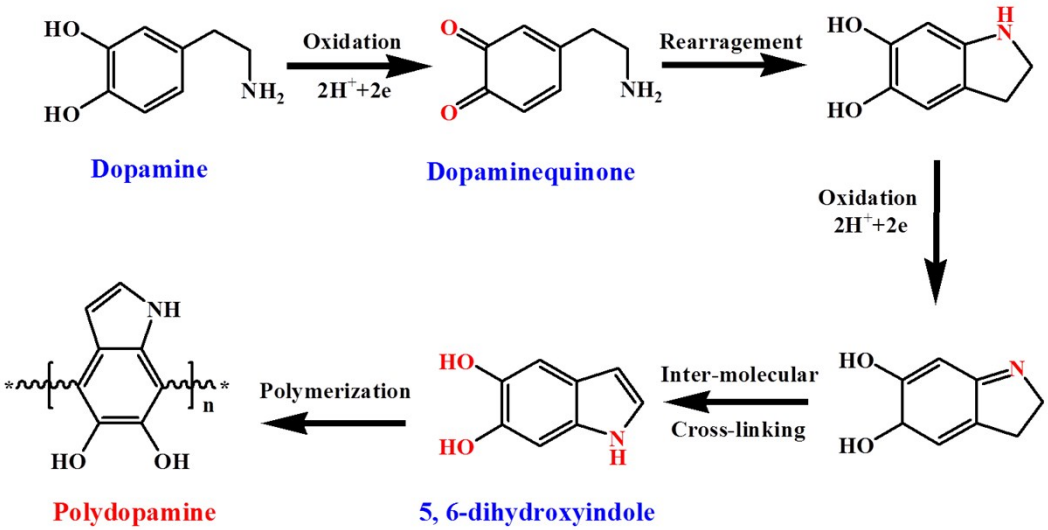

Figure S1. Possible reaction mechanism for dopamine polymerization.

Dopamine could polymerize and stick on all kinds of organic and inorganic surfaces through the formation of strong covalent and noncovalent bonds with surfaces. The polymerization mechanism of DPA was proposed as interaction of a noncovalent self-assembly and a covalent polymerization through oxidation of catechol to dopaminequinone under an aerobic and alkaline condition and then further oxidizes and polymerizes through deprotonation and intermolecular Michael addition reaction to form a cross-linked homopolymer.[1,2]

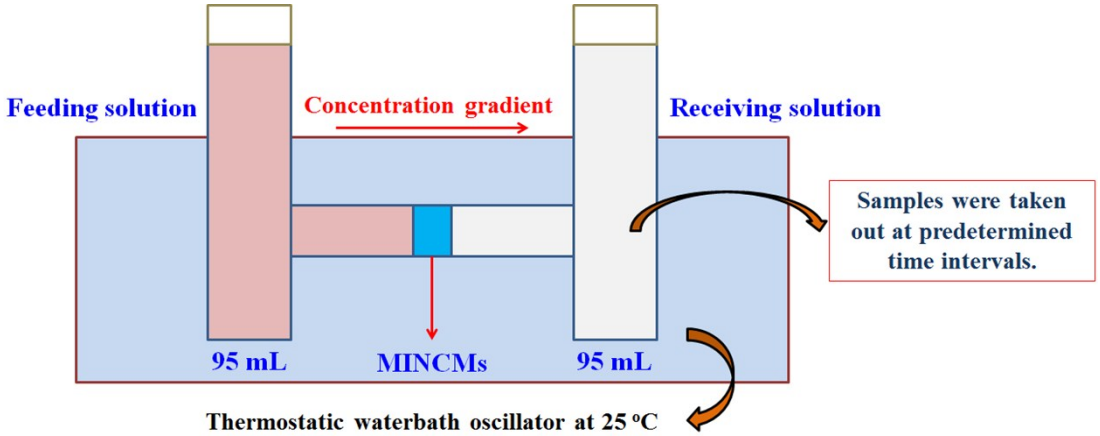

Figure S2. The thermostatic waterbath permeation installation of permeation experiments.

As depicted in Figure S2, the selectivity permeation character of MINCMs was evaluated toward competitive substrates m-cresol and 2,4-DP. The isomer permeation experiments were carried out at room temperature using different concentrations of m-cresol (100, 200, 400, 600, 800, 1000 mg L^{-1}) as the feeding solution.

The time-dependent selective permeation experiments toward artemisinin and artesunate were carried at room temperature with the concentration of 400 mg L^{-1}. The membrane, with an effective area of 1.5 cm^2, was fixed solidly between two chambers of a permeation cell. The volume of each chamber was 150 mL. The mixture solution of m-cresol and 2,4-DP in ethanol (95 mL) was placed in the left-hand side chamber, while 95 mL ethanol was placed in the right-hand side chamber.

References:

[1] Liu, Q.; Wang, N. Y.; Caro, J.; Huang, A. S. Bio-Inspired Polydopamine: A Versatile and Powerful Platform for Covalent Synthesis of Molecular Sieve Membranes. J. Am. Chem. Soc. 2013, 135, 17679-17682.

[2] Lee, H.; Dellatore, S. M.; Miller, W. M.; Messersmith, P. B. Mussel-Inspired Surface Chemistry for Multifunctional Coatings. Science 2007, 318, 426-430.