

Supporting Information

for

**Multilevel/hierarchical nanocomposite imprinted regenerated
cellulose membranes for high-efficiency separation: A selective
recognition method with Au/PDA-loaded surface**

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Experimental Details

The ATR-FTIR spectra (4000-500 cm^{-1}) for modified ACMs were recorded on a FT-IR Nicolet560 apparatus (Nicol, U.S.A.), and ZnSe was used as the crystal plate. X-ray photoelectron spectroscopy (XPS) was performed to investigate the surface chemical composition of various synthesized membranes. The pressure in the analysis chamber was maintained at 5.0×10^{-8} torr or lower during each measurement. The membrane surface roughness was investigated by AFM (Solver P47 Atomic Force Microscopy, Russia) using tapping mode in the range of scanning area of $4\mu\text{m} \times 4\mu\text{m}$ at room temperature in air.

Detailed test conditions of HPLC

High performance liquid chromatography (HPLC) (Agilent 1200 series, U.S.A.) was used for the determination of propranolol, atenolol, bisoprolol and celiprolol. The condition of determination was as follows: methanol/0.02 mmol/L KH_2PO_4 (50/50, v/v) mobile phase, 0.9 mL/min flow rate, 290 nm UV detection and 25 C column temperature.

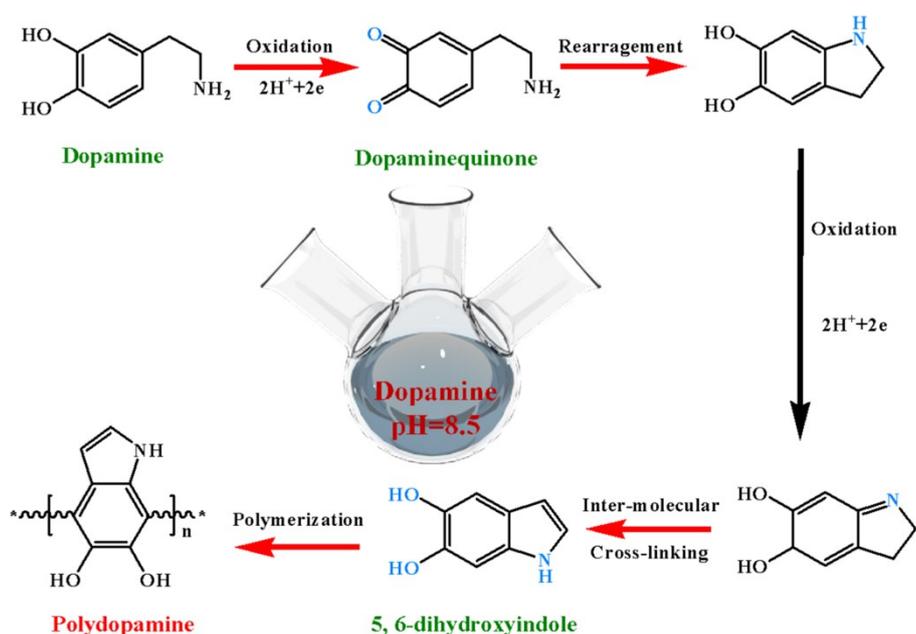


Figure S1. Possible reaction mechanism for dopamine polymerization

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 dopamine 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. The functional groups such as catechol, amine, and imine can serve as both the starting points for covalent modification with desired molecules and the anchors for the loading of transition metal ions, which can further realize the emergence of diverse hybrid materials by virtue of its powerful reducing capability toward these metal ions under basic conditions.

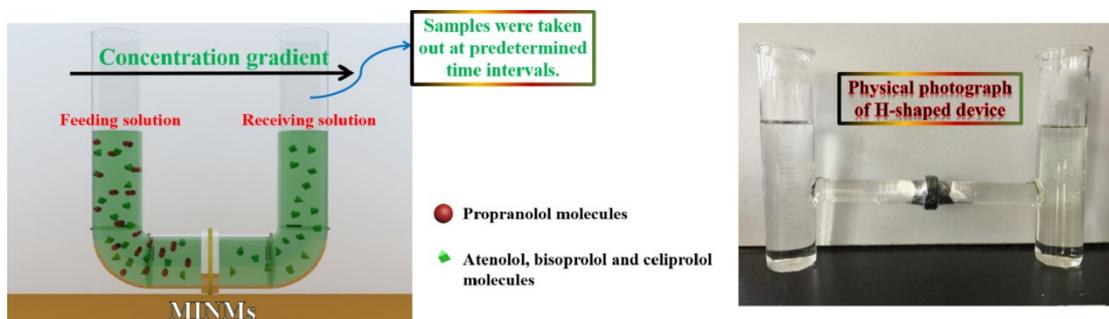


Figure S2. The H-shaped device of permeation experiments.

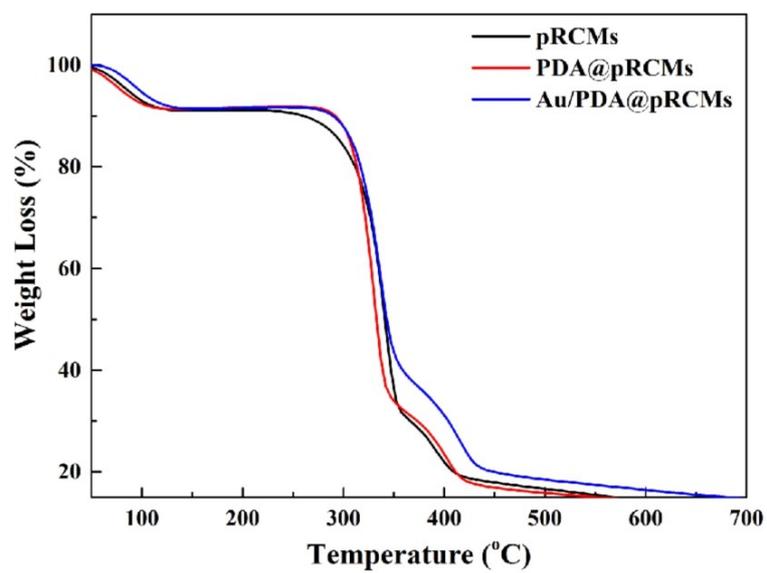


Figure S3. TGA results of pRCMs, PDA@pRCMs and Au/PDA@pRCMs.

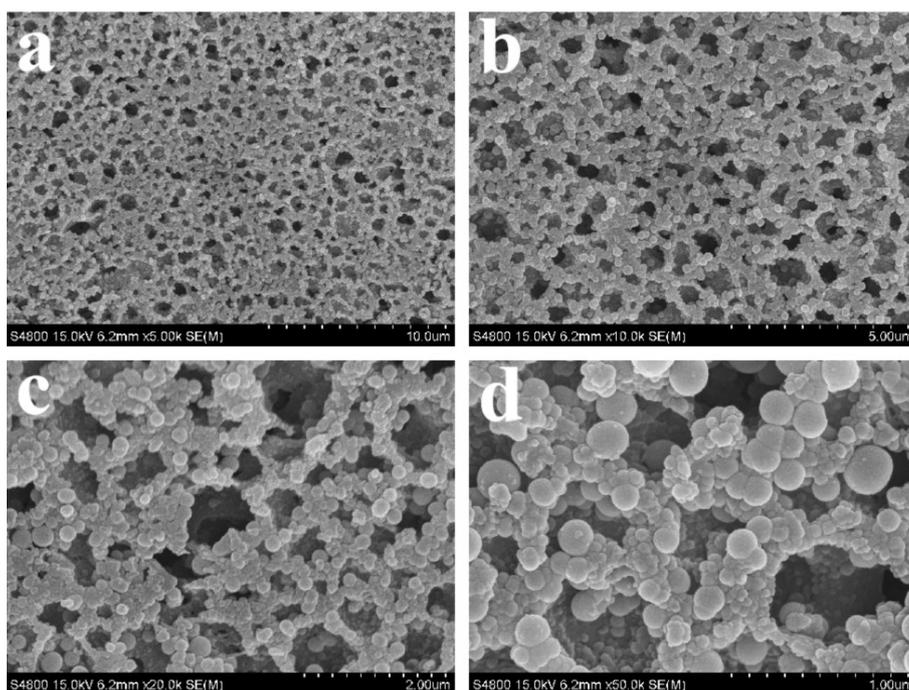


Figure S4. SEM results of MINMs synthesized by imprinting time of 36 h.

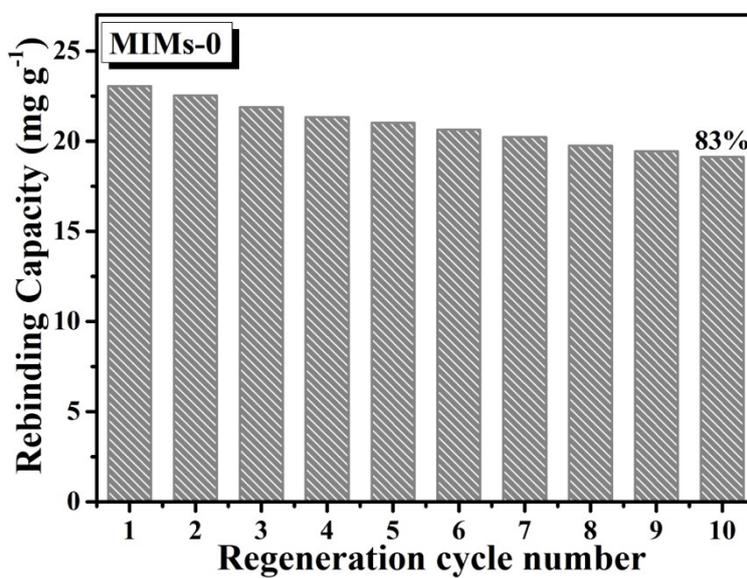


Figure S5. Regeneration performance of MIMs-0

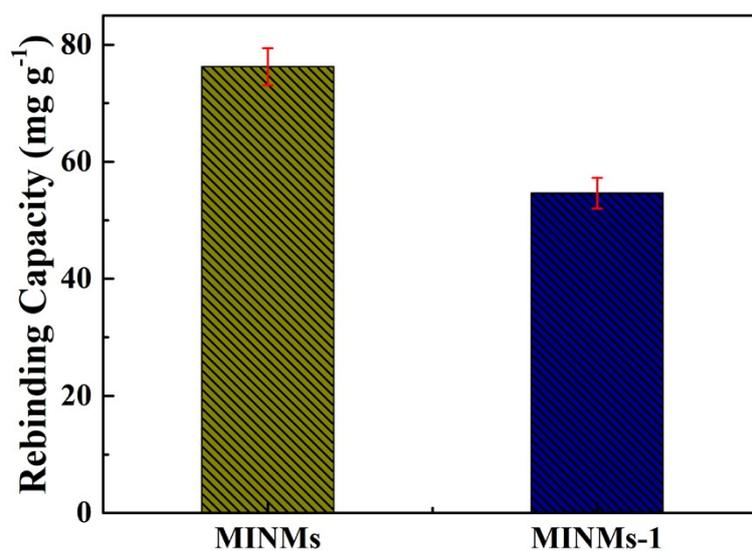


Figure S6. Rebinding capacities of MINMs and MINMs-1.

Table S1. Comparison of the rebinding capacities between MINMs and other adsorption materials

Materials	Target molecules/ions	Q (mg g ⁻¹)	Ref
CBMIMs	enoxacin	32.10	S1
PMIMs	bisphenol A	46.65	S2
NBMIMs	artemisinin	66.90	S3
P-AGNMs	propranolol	54.90	S4
GT-MIMs	propranolol	53.44	S5
MINMs	propranolol	76.87	This work

Reference

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