Electronic Supporting Information (ESI) for

Chiral metal-organic framework coated quartz crystal microbalance for chiral discrimination

Hao-Jie Duan, Cheng-Xiong Yang* and Xiu-Ping Yan*

College of Chemistry, Research Center for Analytical Sciences, State Key Laboratory of Medicinal Chemical Biology (Nankai University), Tianjin Key Laboratory of Molecular Recognition and Biosensing, Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), Nankai University, 94 Weijin Road, Tianjin 30071, China.

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* Corresponding authors. Tel/Fax: (86)-22-23506075
E-mail: cxyang@nankai.edu.cn; xpyan@nankai.edu.cn

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Characterization of Zn₂(bdc)(L-lac)(dmf)·DMF

The X-ray diffraction (XRD) pattern of Zn₂(bdc)(L-lac)(dmf)·DMF was recorded with a D/max-2500 diffractometer (Rigaku, Japan) using CuKα radiation (λ=1.5418 Å). XRD data collected over the angular range from 3 to 80° 2θ with a step 0.02°. Thermogravimetric analysis (TGA) of Zn₂(bdc)(L-lac)(dmf)·DMF was performed on a PTC-10A thermal gravimetric analyzer (Rigaku, Japan) from room temperature to 700 °C at a ramp rate of 10 °C min⁻¹. The surface area, pore volume, and pore size distributions of Zn₂(bdc)(L-lac)(dmf)·DMF was measured by N₂ adsorption-desorption isotherms on a NOVA 2000e surface area and pore size analyzer (Quantachrome, USA) at 77 K. About 0.1113 g of Zn₂(bdc)(L-lac)(dmf)·DMF was used and was thoroughly out-gassed at 150 °C for 12h . The relative pressures used for calculating BET surface area was 0.1-0.3 for Zn₂(bdc)(L-lac)(dmf)·DMF. The prepared Zn₂(bdc)(L-lac)(dmf)·DMF gave a BET surface area of 377.5 m² g⁻¹ with a pore volume of 0.22 cm³ g⁻¹. The morphology of Zn₂(bdc)(L-lac)(dmf)·DMF coating was characterized on a QUANTA 200 scanning electron microscope (SEM) (FEI, Hillsboro, Oregon).
Structures of four pairs of enantiomers

R-1-Phenylethylamine

S-1-Phenylethylamine

R-1-Phenylethanol

S-1-Phenylethanol

R-1-(4-Methoxyphenyl)ethylamine

S-1-(4-Methoxyphenyl)ethylamine

R-1-(1-Naphthyl)ethylamine

S-1-(1-Naphthyl)ethylamine

**Fig. S1** Structures of four pairs of enantiomers.
Reversibility of the adsorption of enantiomers on Zn$_2$(bdc)(L-lac)(dmf)·DMF

The changes of the frequency with time were continuously monitored by exposing to the enantiomers and then purging with pure nitrogen gas. The results show that the adsorption-desorption process was reversible for four pairs of enantiomers. Detail information for the adsorption and desorption for S-1-Phenylethylamine is shown Fig. S2.

![Adsorption and desorption curve](image)

**Fig. S2** Adsorption and desorption curve monitored continuously for the adsorption of 0.5 μL S-1-Phenylethylamine and desorption with pure nitrogen at 30 °C.
**Dimensions of four pairs of enantiomers**

Fig. S3 Dimensions of four pairs of enantiomers calculated with chem-3D. (C gray; O red; N blue; H white.)

**Fig. S4** Cavity size of Zn$_2$(bdc)(L-lac)(dmf)-DMF calculated by the software named “Diamond”.
**Fig. S5** The steric hindrance when $S$ and $R$ enantiomer interact with $\text{Zn}_2(\text{bdc})(\text{L-lac})(\text{dmf})\cdot\text{DMF}$ (The same situation for four pairs of enantiomers) (C gray; O red; N blue; H white; $C^*$ chiral carbon.)

**Fig. S6** A homemade PTFE crystal-holder to limit the thin coating of $\text{Zn}_2(\text{bdc})(\text{L-lac})(\text{dmf})\cdot\text{DMF}$ to the gold surface of the QCM crystal.