Supporting Information

Preparation of mesocellular siliceous foam supported lanthanides-sensitive polymer for selective adsorption of lanthanides

Wen-kui Li[1,2,3], Piao Lin[1], Sheng Dai[4], Ying-lin Shen[1]*

[1] Radiochemistry Laboratory, Lanzhou University, Lanzhou 730000, PR China

[2] CAS Key Laboratory of Chemistry of Northwestern Plant Resources and Key Laboratory for Natural Medicine of Gansu Province, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou 730000, PR China

[3] University of Chinese Academy of Sciences, Beijing 100039, PR China

[4] Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA

* Corresponding author: Tel: +86-15095370178, *E-mail address*: shenyl@lzu.edu.cn (Ying-lin Shen);

Reagents and materials

Ammonium fluoride (NH_4F), divinylbenzene (DVB) and ammonia water (25%) were gained from Sinopharm Chemical Reagent Co., Ltd. (Beijing, China). Poly (ethylene oxide)-block-poly (propyleneoxide)-block-poly (ethylene oxide) triblock copolymer (Pluronic P123) was purchased from Tianjin Siensi Biochemical Technology Co., Ltd. (Tianjin, China). 1,3,5-Trimethylbenzene (TMB), arsenazo III and nitric acid were purchased from Tianjin Guangfu Fine Chemical Research Institute (Tianjin, China). Tetraethoxysilane (TEOS) was purchased from Shanghai Reagent Factory (Shanghai, China). 2-Methyl-2-oxazoline (MOL) was gained from Tokyo Chemical Industry Co., Ltd. (Shanghai, China). Boron trifluoride ether solution was purchased from Aladdin Industrial Corporation (Shanghai, China). High purity lanthanum (La), europium (Eu), uranium (U) and thorium (Th) oxides were purchased from Changchun Institute of Applied Chemistry, Chinese Academy of Sciences (Changchun, China), and their nitrates were obtained by dissolution of corresponding oxides in concentrated nitric acid and dried. All the used reagents were of analytical grade without further purification.

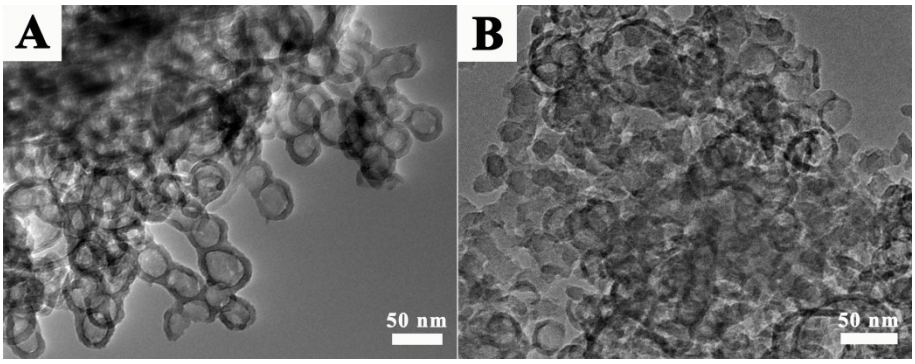

Fig. S1 TEM images of MCFs (A) and MOL-DVB-MCFs (B).

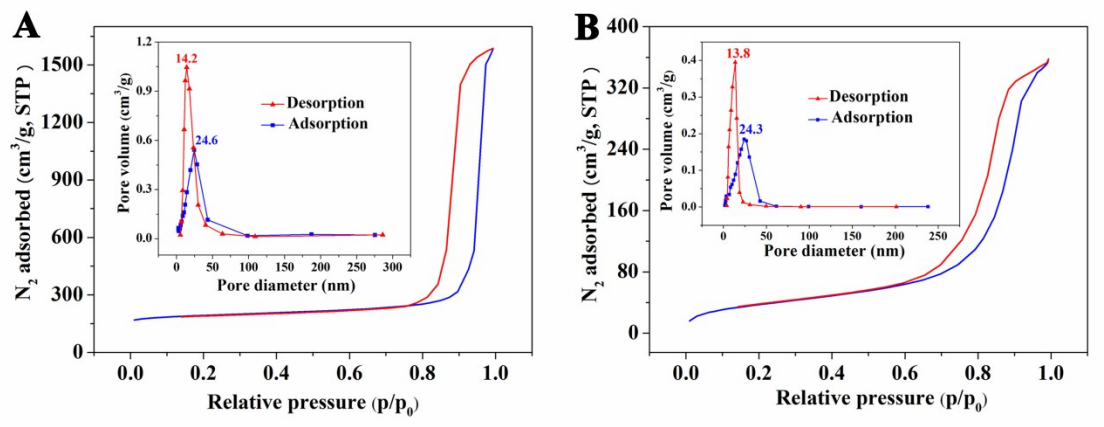

Fig. S2 Nitrogen sorption isotherms and corresponding pore size analyses based on the Barrett-Joyner-Halenda (BJH) pore analysis method for MCFs (A) and MOL-DVB-MCFs (B).

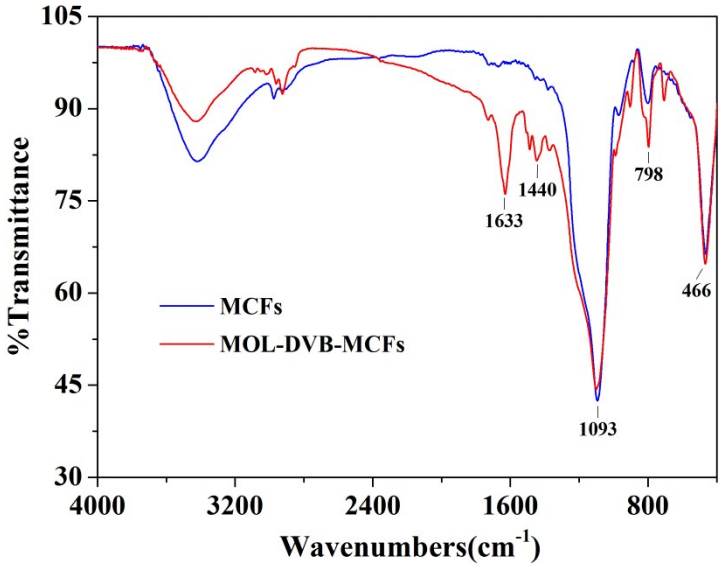

Fig. S3 FTIR spectra of MCFs and MOL-DVB-MCFs.

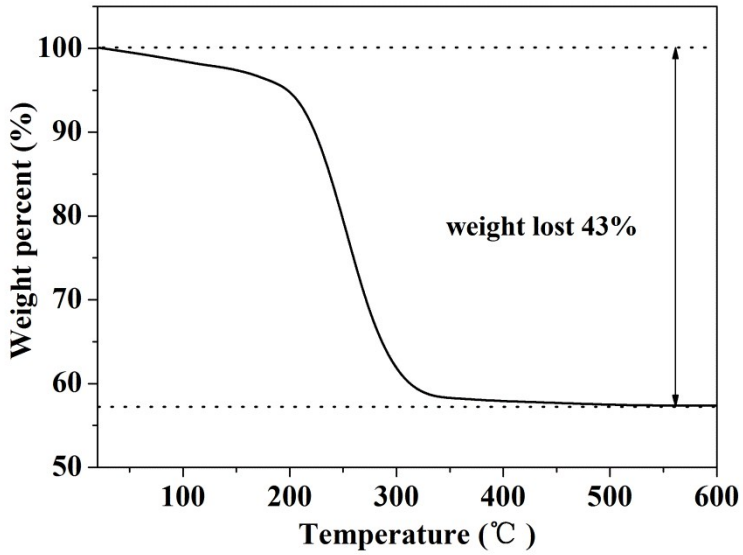

Fig. S4 TGA curve of MOL-DVB-MCFs.

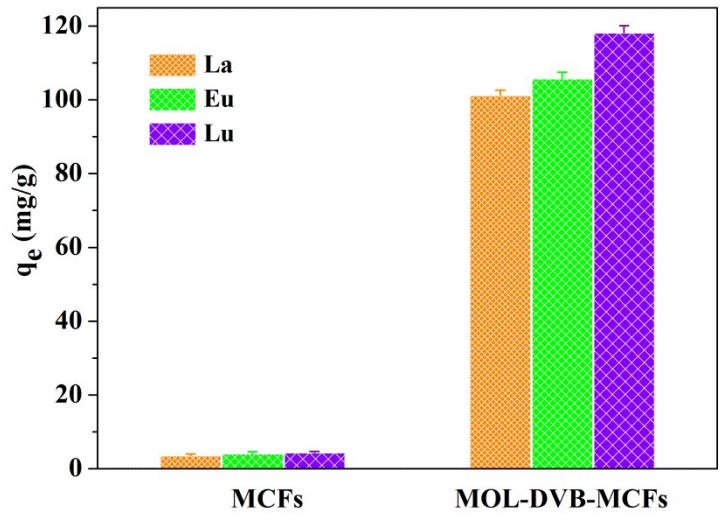

Fig. S5 The comparison of adsorption of La^{3+}, Eu^{3+} and Lu^{3+} by MCFs and MOL-DVB-MCFs.

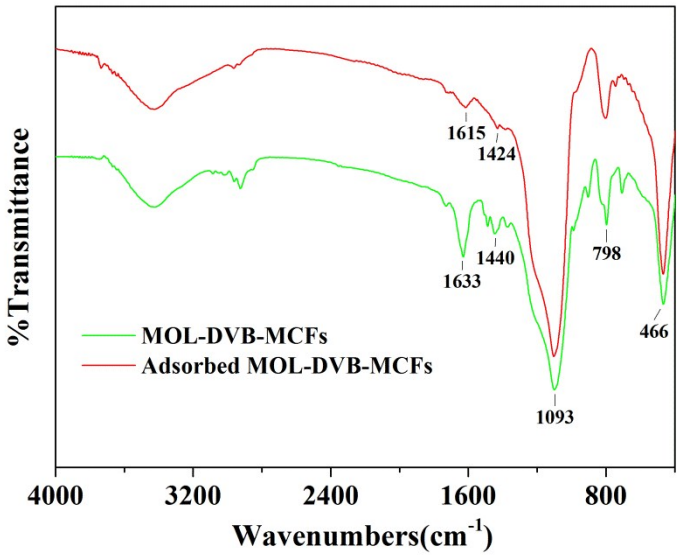

Fig. S6 FTIR spectra of MOL-DVB-MCFs and MOL-DVB-MCFs loaded with Eu^{3+}.

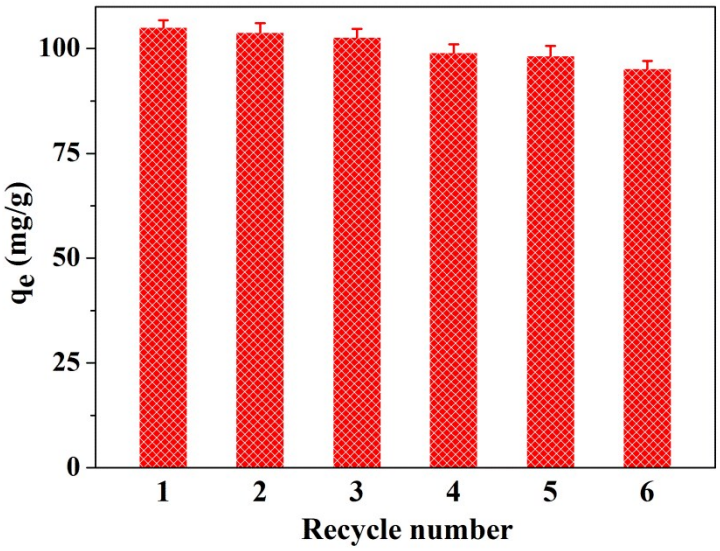

Fig. S7 Reusability evaluation of the composite by repeated adsorption of Eu^{3+} and evaluating the obtained adsorption capacity q_e.