Supporting Information for

Well-defined Functional Mesoporous Silica/Polymer Hybrids Prepared by ICAR ATRP Technique Integrated with Bio-inspired Polydopamine Chemistry for Lithium Isotopes Separation

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* Supporting information includes 5 pages, 3 figures and 1 table.

● Experimental details

1. Materials

Tetramethoxysilane (TMOS), Pluronic P123 (average molecular weight ~ 5800), magnesium chloride ($MgCl_2$), N,N-dimethylmethanamide (DMF), tetrahydrofuran (THF), glycidylmethacrylate (GMA, 99%), dopamine hydrochloride (~ 98%), tris-(hydroxymethyl)aminomethane (Tris base, 99.5%), triethylamine (TEA, >99%), α-bromoisobutyryl bromide (BiBB, 98%), ethyl 2-bromoisobutyrate (EBiB, 98%), α, α'-azoisobutyronitrile (AIBN, 98%), copper (II) chloride ($CuCl_2$, >99%), anisole (99%) were purchased from J&K Scientific Co. 4'-aminobenzo-15-crown-5 (NH_2-B15C5) was synthesized according to previous reports.[1-3] Deionized (DI) water with resistivity >18 MΩ cm was obtained from a Milli-Q water purification system. Other analytical grade chemicals including hydrochloric acid (HCl) and ethanol were commercially obtained and used without further purification.

2. Characterizations

Elemental analysis was performed on Elementar Vario EL III. N_2 adsorption-desorption isotherms were measured by a NOVA 3200e Surface Area & Pore Size Analyzer. Samples were dried at 70 ºC under vacuum for at least 3 h before the nitrogen adsorption experiments. Specific surface areas were calculated based upon the Brunauer–Emmett–Teller (BET) method, and pore size distribution was calculated by the Barrett−Joyner−Halenda (BJH) method. Powder small angle X-ray diffraction (SAXRD) patterns were recorded by Rigaku D/max-2400 X-ray powder diffractometer ($0.6<\theta<8$) with Cu Kα radiation. Surface morphology of the functional mesoporous silica/polymer hybrids was examined by LEO 1530 scanning electron microscope (SEM) with an accelerating voltage of 20 kV. Thermogravimetric analysis (TGA) was carried out on a TA Instrument TGA 2950 under a nitrogen atmosphere. Size exclusion chromatography (SEC) was used to determine molecular weight and molecular weight distribution of the PGMA chains. Linear PMMA standards were used for calibration.

- **Supporting figures and tables**

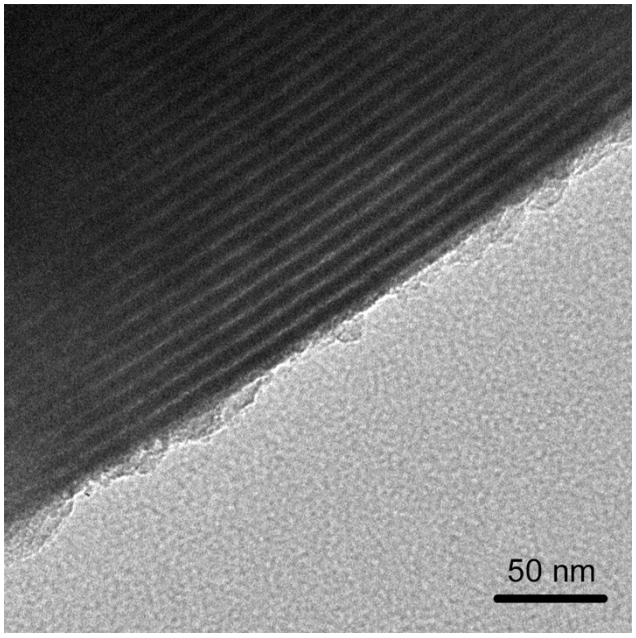

Figure S1. TEM image of SBA-15@PDA-BiBB.

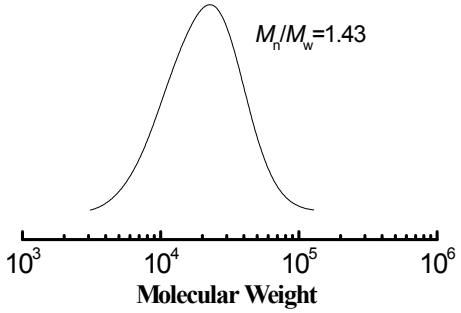

Figure S2. Molecular weight distribution of PGMA obtained by using sacrificial initiator in the ICAR ATRP system.

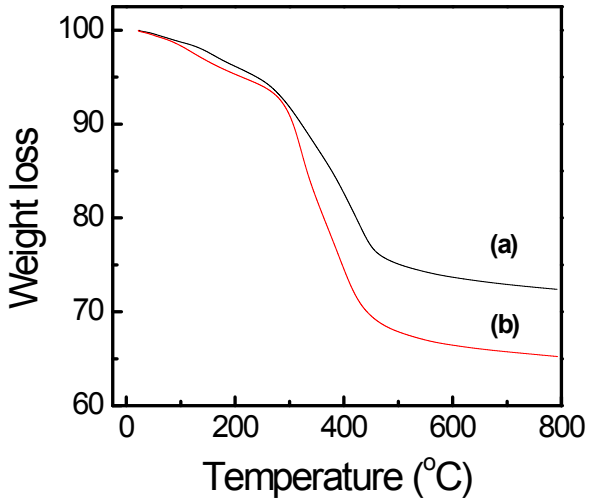

Figure S3. TGA curves of SBA-15@PDA@PGMA (a) and SBA-15@PDA@PGMA-B15C5 (b).

Table S1 Kinetic parameters fitted by using the pseudo-second-order kinetic model.

k_2 (g mg^{-1} min^{-1})	R^2	$q_{t,cal}$ (mg/g)	h (mg g^{-1} min^{-1})
0.039	0.994	4.49	0.78

Supporting references

1. R. Ungaro, B. El Haj and J. Smid, *J. Am. Chem. Soc.*, 1976, **17**, 5198-5202.
2. Y. Liu, F. Liu, G. Ye, N. Pu, F. Wu, Z. Wang, X. Huo, J. Xu and J. Chen, *Dalton T.*, 2016, **45**, 16492-16504.
3. D. W. Kim, H. J. Kim, J. S. Jeon, K. Y. Choi and Y. S. Jeon, *J. Radioanal. Nucl. Ch.*, 2000, **245**, 571-574.