Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting information for

Boronate affinity mesoporous silica nanoparticles based selective enrichment for highly efficient analysis of ginsenosides

Yang Chen[a,b], Weiman Zhao[a], Chen Qing[a], Wei Wu[a], Shaoyong Chen[b], Zijun Bie[a,b]*

a. School of Pharmacy, Bengbu Medical University, 2600 Donghai Avenue, Bengbu 233000, China

b. Department of Chemistry, Bengbu Medical University, 2600 Donghai Avenue, Bengbu 233000, China

*Corresponding author: Dr. Zijun Bie. E-mail: biezijun@bbmc.edu.cn

SUPPLEMENTARY DATA

Table S1. Detail information of powder X-Ray diffraction patterns

Material	d_{100}/Å	a_0 /Å
MSN	34.8	40.1
BA-MSN	34.3	39.5

The d_{100} numbers represent the d-spacing corresponding to the main (100) XRD peak.

The unit-cell size (a_0) is calculated from the d_{100} using the formula $a_0 = 2\ d_{100}/3^{1/2}$.

Table S2. Comparison of different separation method for ginsenoside

Method	Separation media	Target	RSD	LOD	Recovery	Ref
HILIC-ELSD	Phenomenex Luna HILIC column	ginsenoside Rb1	3.1%	0.025mg/mL	97.2%	1
2D LC-ESI MS	TSKGEL Amide-80 column & Acquity BEH C18	Ginsenoside Rd	1.8%	1ng/mL	101.6%	2
RP HPLC-PDA	Waters Symmetry C18	ginsenosides Rg1	4%	0.01mg/mL	98.3%	3
GC-MS	HP-1 fused-silica capillary	ginsenoside Rb1	5%	3ng/mL	80%	4
Proposed method	BA-MSNs	Ginsenoside Re	4%	0.5μg/mL	85%	-

Reference

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2. S. Y. Wang, L. Z. Qiao, X. Z. Shi, C. X. Hu, H. W. Kong, G. W. Xu, *Anal. Bioanal. Chem.*, 2015, **407**, 331.

3. A, J. Lau, S. O. Woo, H. L. Koh, *J. Chromatogr. A,* 2003, **1011**, 77.

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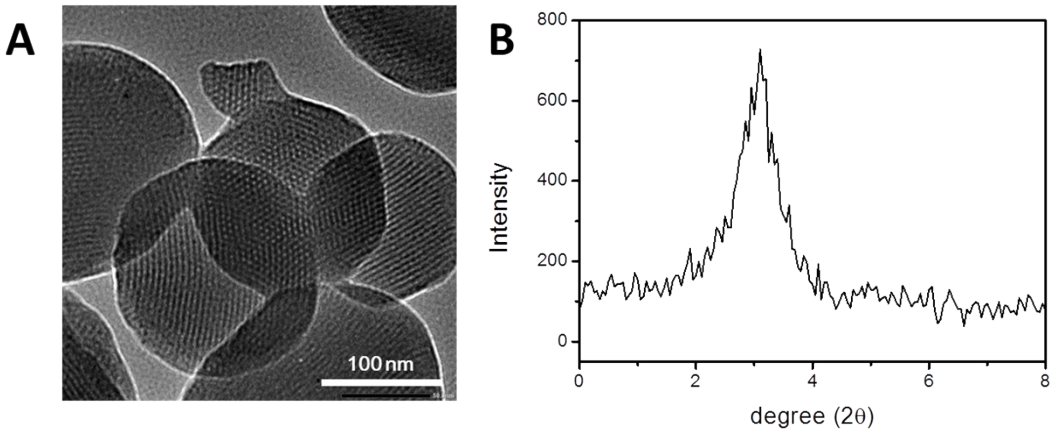

Figure S1. (A) TEM and (B) XRD of mesoporous silica nanoparticles.

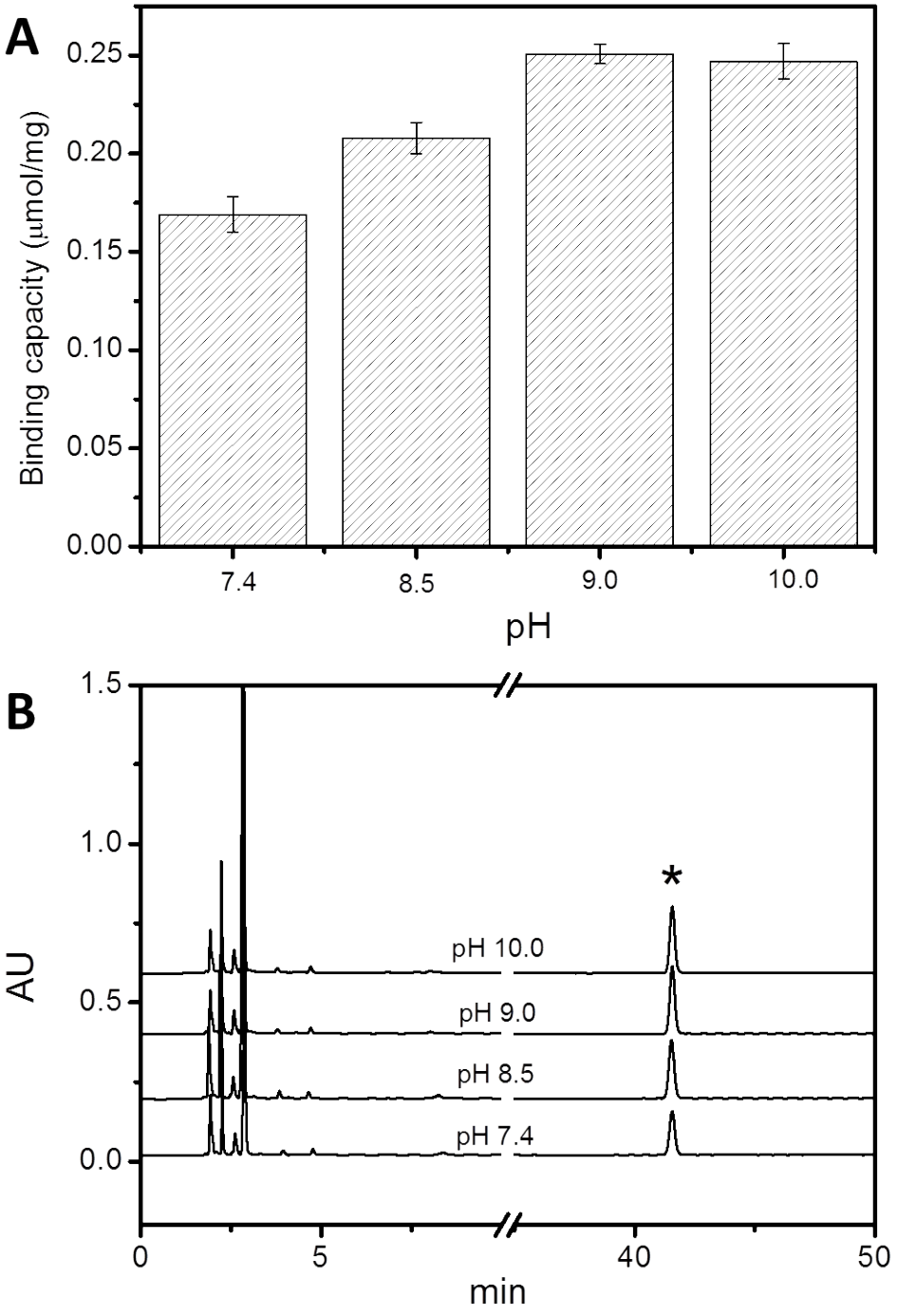

Figure S2. Binding performances of BA-MSNs towards ginsenoside Re at different pH of loading buffer. (A) binding capacity and (B) corresponding chromatograms. * indicates ginsenoside Re.

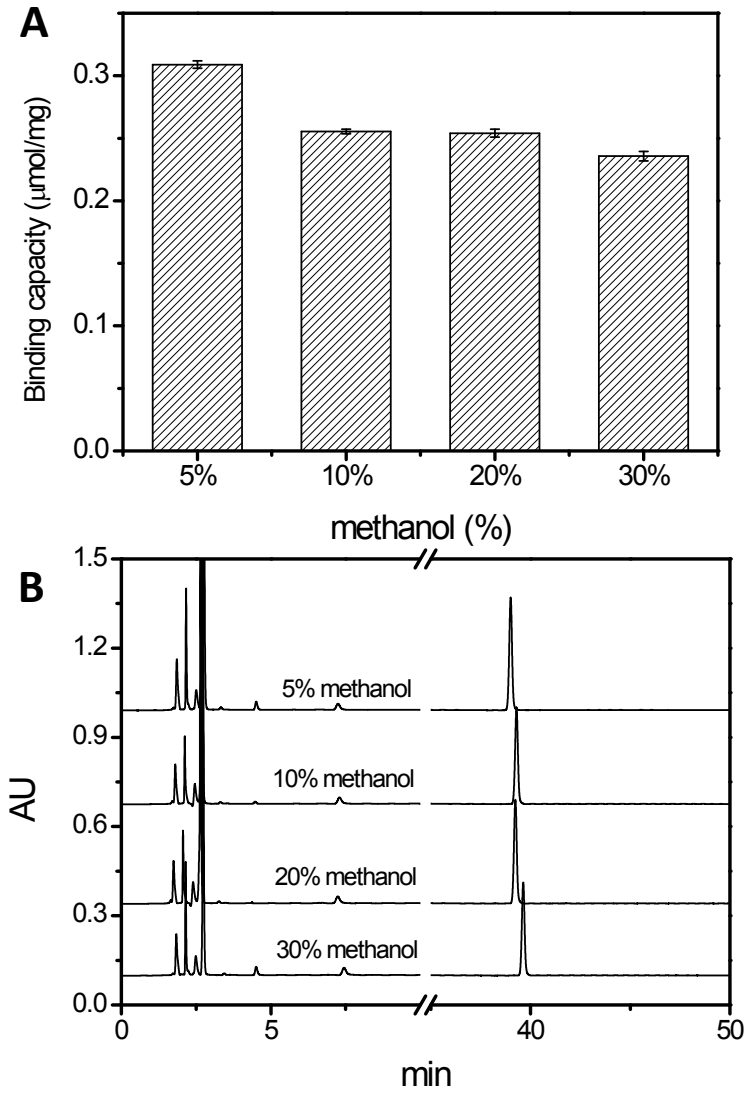

Figure S3. Binding performances of BA-MSNs towards ginsenoside Re at different amount of methanol in loading buffer. (A) binding capacity and (B) corresponding chromatograms. * indicates ginsenoside Re.

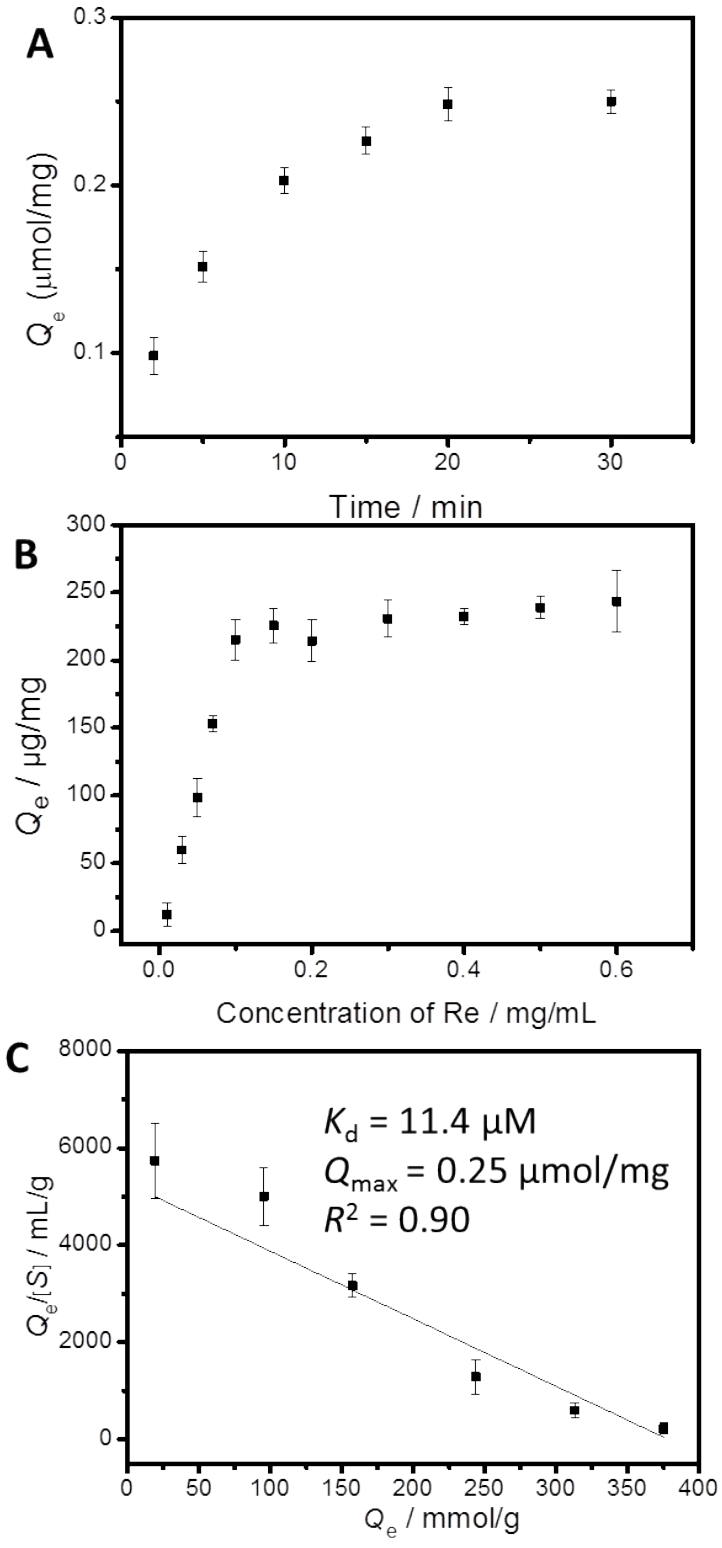

Figure S4. Binding performances of BA-MSNs towards ginesnoside Re (A) binding equilibrium, (B) binding isotherm and (c) corresponding scatchard plots of binding isotherm of BA-MSNs.

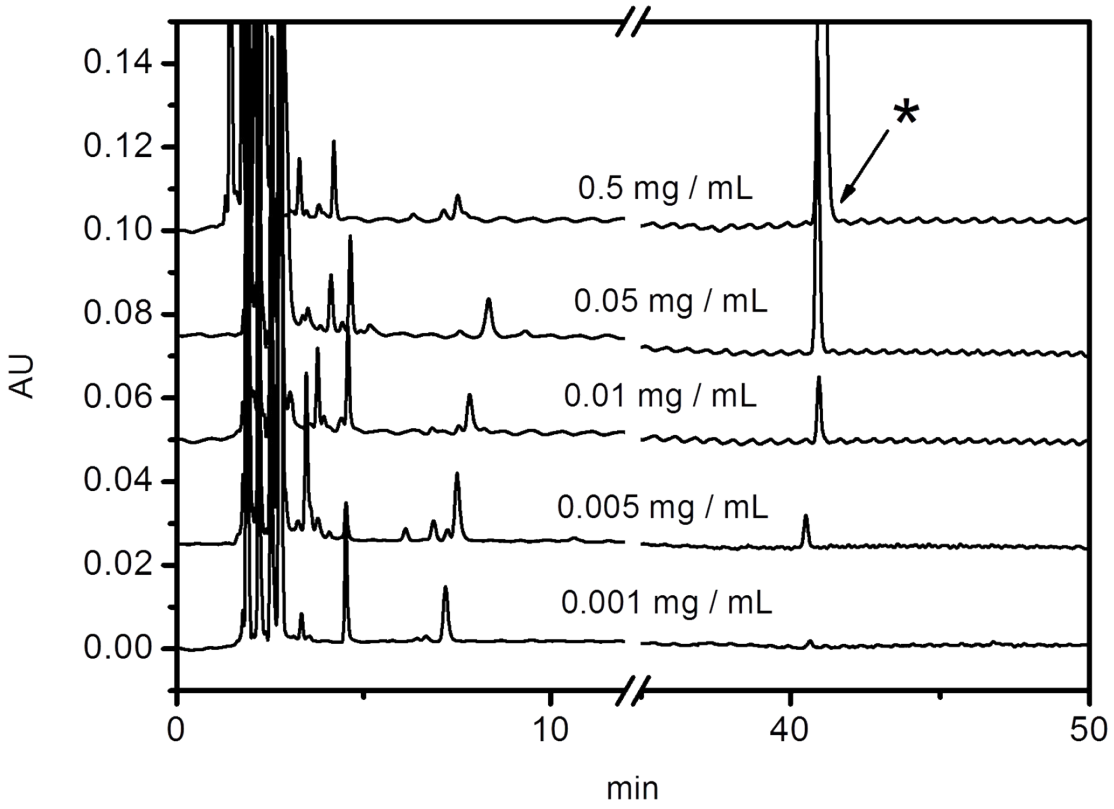

Figure S5. Chromatographic analysis of ginsenoside Re of different concentrations after extracted with BA-MSNs. * indicates ginsenoside Re.

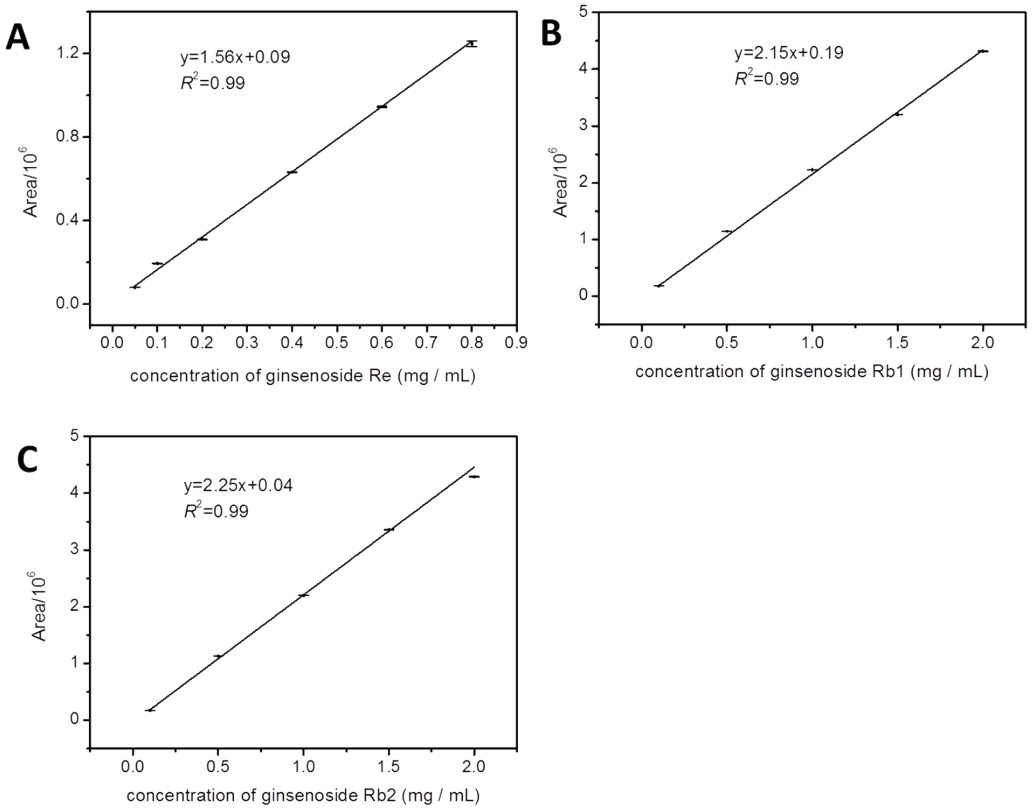

Figure S6. Calibration curve of different ginsenosides (A) Re, (B) Rb1 and (C) Rb2.