Supplementary Material

Molecularly imprinted polymer coated silica microbeads for high performance liquid chromatography

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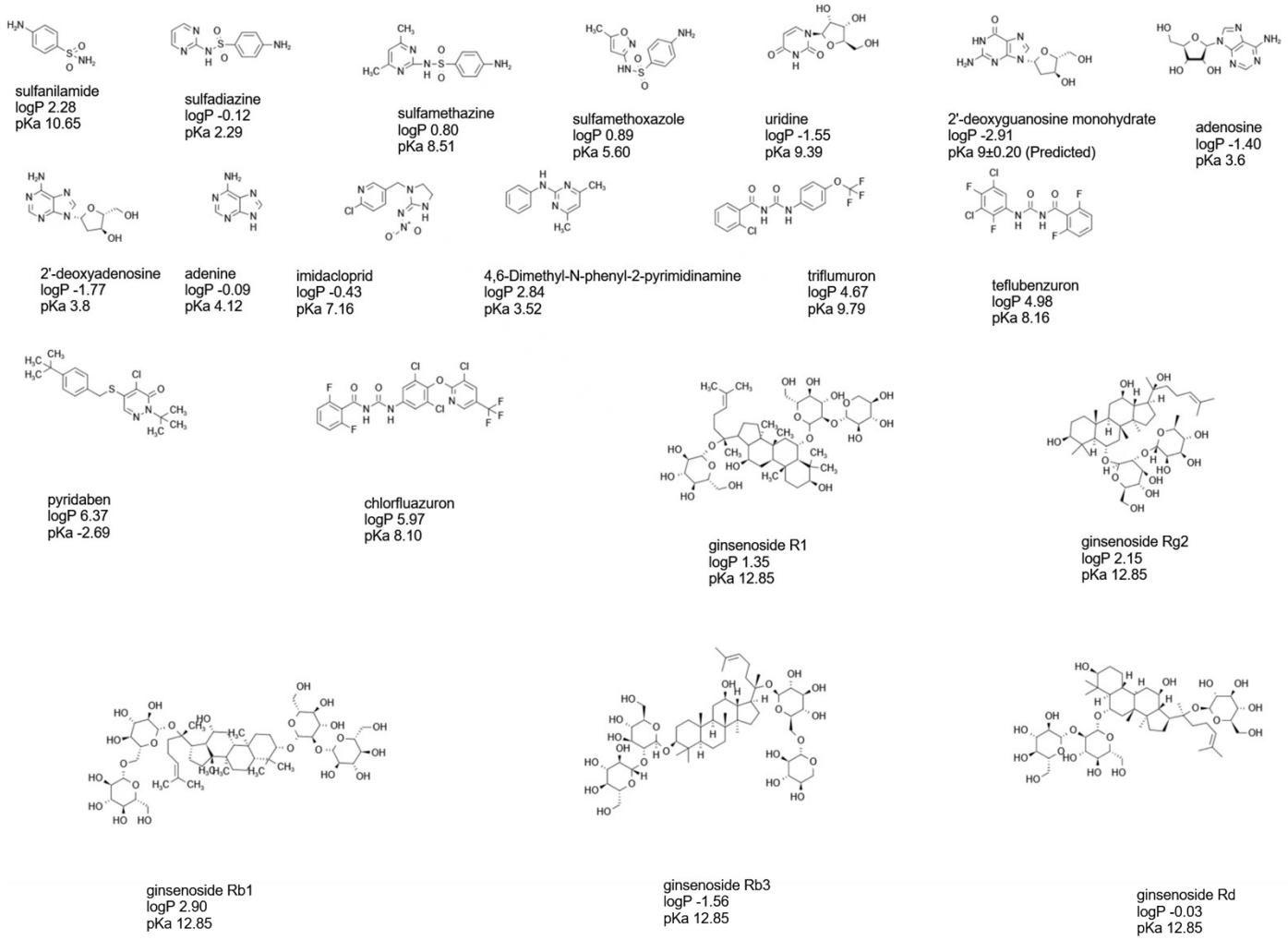

Figure S1 Chemical structures of the analytes measured in this work.

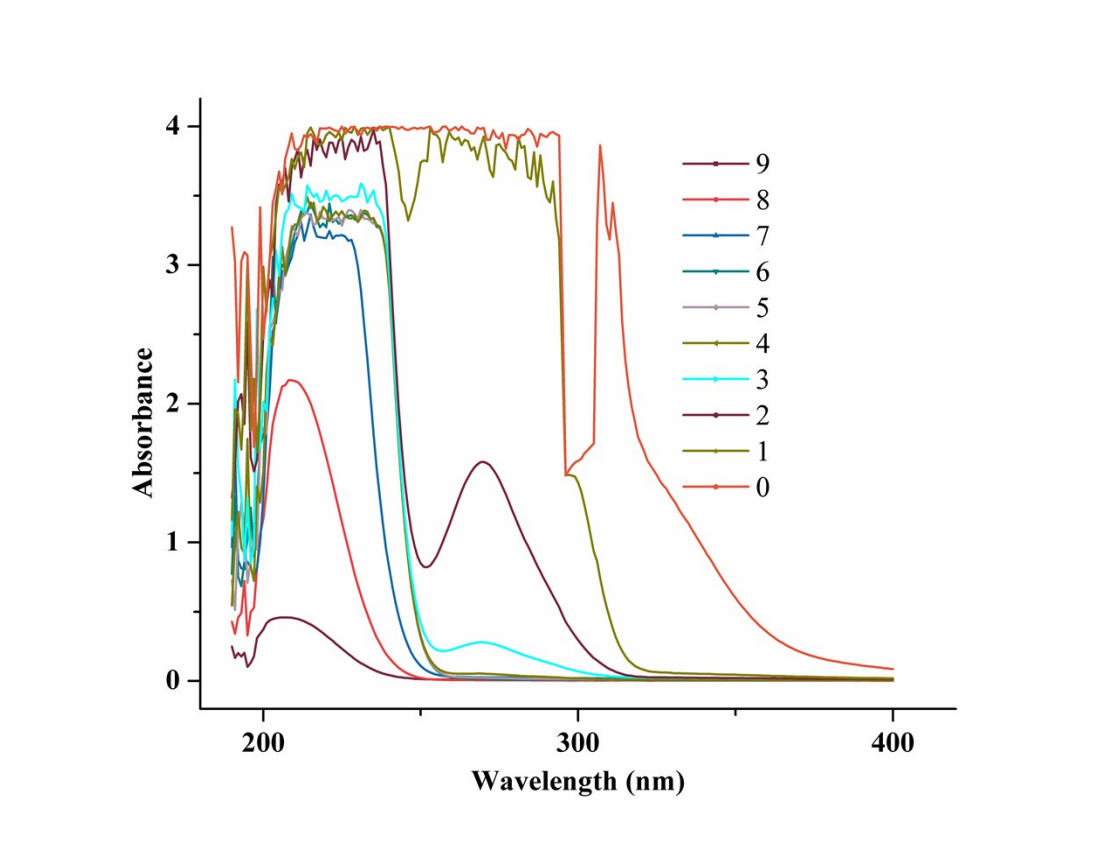

Figure S2 The ultra-violet absorption spectra of the solutions (including the reaction solution (namely 0 times), the MeOH-HAC solutions after elution the materials 1-6 times, and ethanol after elution the materials 3 times (namely 7-9 times)).

The procedure for synthesis of C18/SiO_2 stationary phase.

Firstly, bare silica (particle size, 5 μm; pore size, 30 nm) was activated by 15% (wt.%) dilute nitric acid aqueous solution under quick stirring at room temperature. 1.5 h later, the materials were washed to neutral by deionized water, the materials were collected and dried. Secondly, C18 was modified on the silica: 2 g activated bare silica microbeads, 47 mL anhydrous toluene, 2 mL of octadecyltrichlorosilane were mixed and refluxed under 110℃ for 24 h. The resulting materials were eluted with toluene and ethyl alcohol, and dried. Thirdly, end-capping: the material from the second step, 2 mL of trimethyl chlorosilane and 47 mL of anhydrous toluene were mixed and refluxed in oil bath under 110℃ for 24 h.

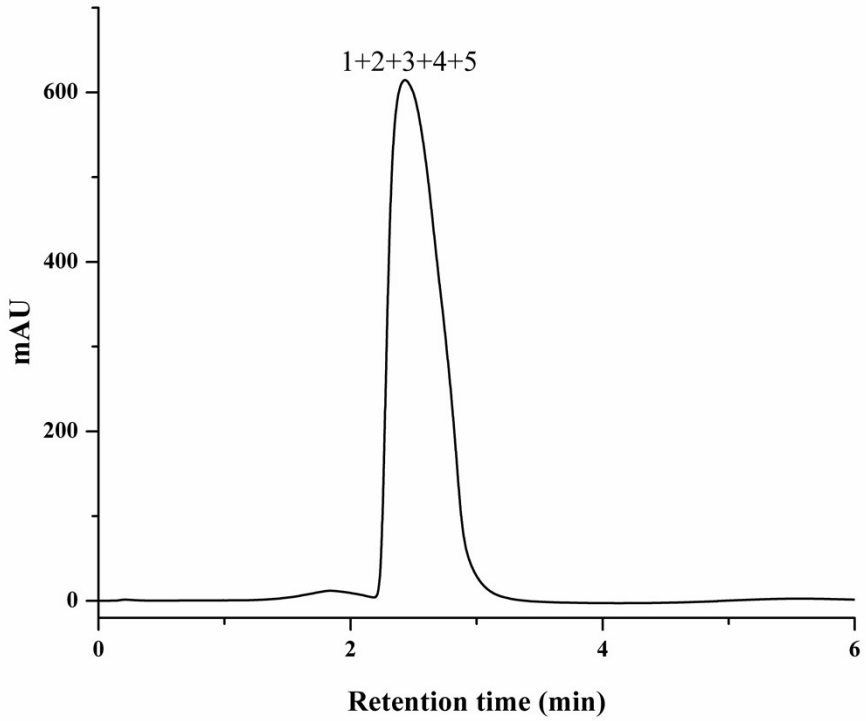

Figure S3 Chromatogram of ginsenosides on the Amino-SiO_2 column. Chromatographic conditions: 30% ACN-70%H_2O (v:v). Flow rate: 0.2 mL/min, detection wavelength: 203 nm, injection volume: 5 μL. Peak: 1. ginsenoside R1, 2. ginsenoside Rg2, 3. ginsenoside Rb1, 4. ginsenoside Rb3, 5. ginsenoside Rd.

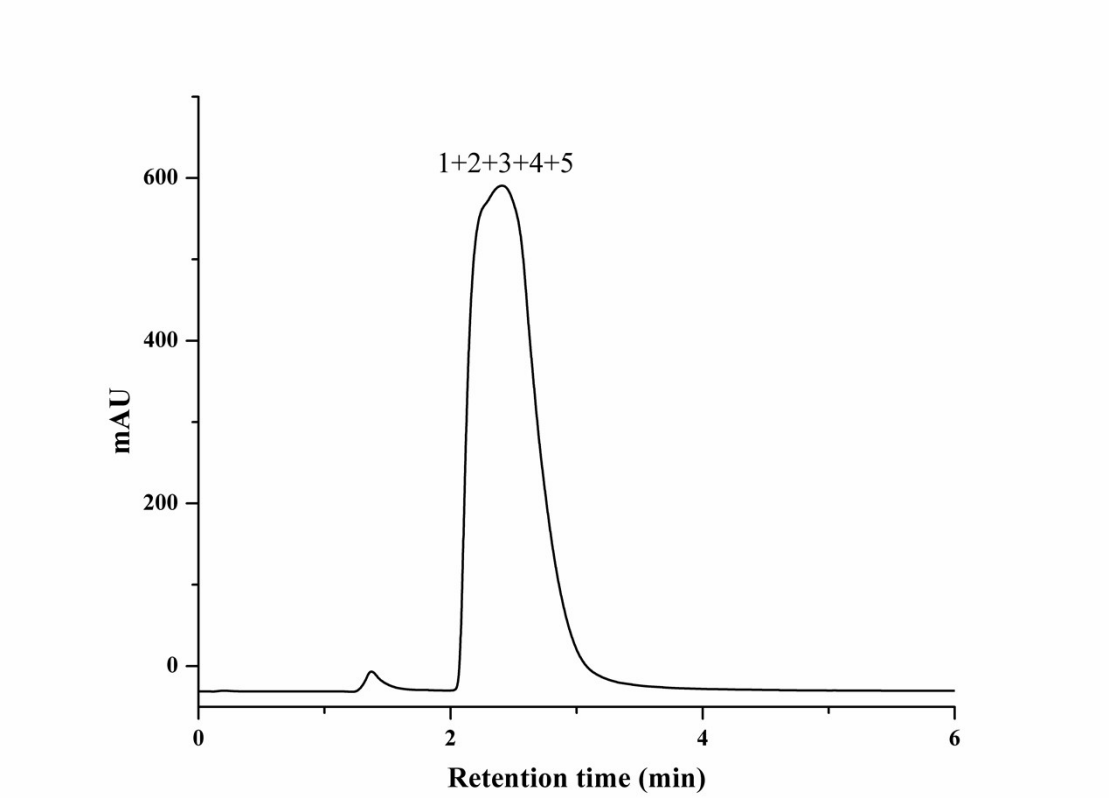

Figure S4 Chromatogram of ginsenosides on a Diol-SiO_2 column. Chromatographic conditions: 30% ACN-70%H_2O (v:v). Flow rate: 0.2 mL/min, detection wavelength: 203 nm, injection volume: 5 μL. Peak: 1. ginsenoside R1, 2. ginsenoside Rg2, 3. ginsenoside Rb1, 4. ginsenoside Rb3, 5. ginsenoside Rd.

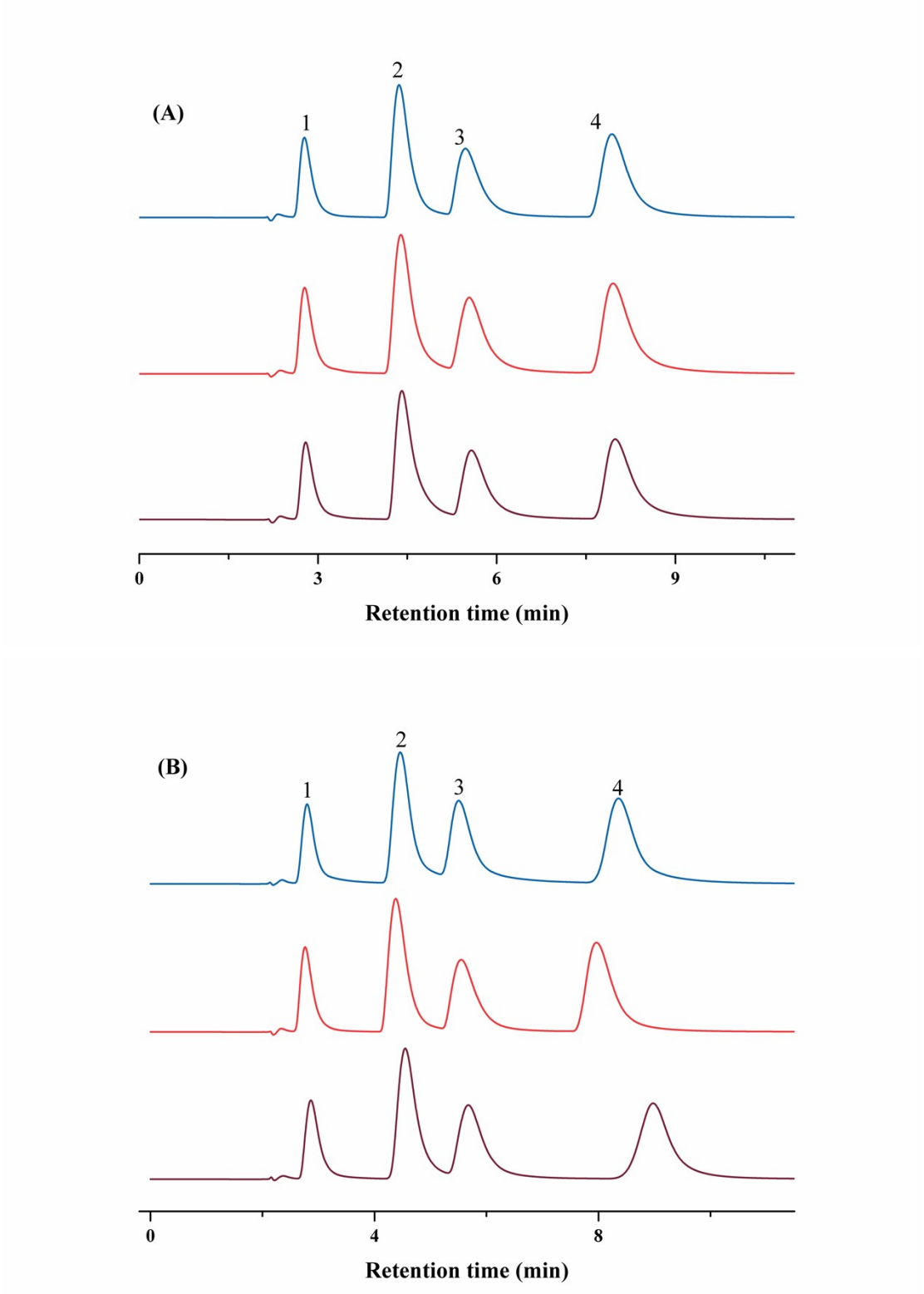

Figure S5 Chromatographic separation of mixture of sulfonamides: 1. SM, 2. SDZ, 3. SMZ, 4. SMO. Column (2.1 mm × 150 mm) packed with the same batch of MIP/SiO_2 SP (A) and three different batches of MIP/SiO_2 SP (B). Chromatographic conditions: 0.5% MeOH-99.5% H_2O (v:v), Flow rate: 0.2 mL/min, detection wavelength: 270 nm, injection volume: 5

μL.

Table S1. Pore structure and carbon content of the materials.

materials	Particles SBET[a] (m^2 g^{-1})	Pore size[b] (nm)	Pore volume[c] (cm^3 g^{-1})	Carbon content (wt.%)
bare silica	111.7	31.7	0.7	0.4
double bond-modified-silica	92.9	27.1	0.7	4.0
MIP/SiO_2	97.9	26.2	0.7	3.7
NIP/SiO_2	94.1	22.8	0.6	5.2

a BET surface area.

b BJH adsorption average pore size.

c BJH adsorption cumulative volume of pores between 8.500 Å and 1,500.000 Å radius.

Table S2 Chromatographic data of sulfonamides on the stationary phases.

Analytes	MIP/SiO_2 SP N/m	T_f	Rs	NIP/SiO_2 SP N/m	T_f	Rs	C18/SiO_2 SP N/m	T_f	Rs
sulfanilamide	6000	1.66	-	4570	2.08	-	8270	2.00	-
sulfadiazine	8650	1.49	3.96	5660	2.60	3.90	4850	2.04	1.40
sulfamethazine	8840	1.63	1.93	4940	3.14	1.60	10250	1.98	2.43
sulfamethoxazole	13510	1.29	4.34	4930	4.06	4.23	10080	1.30	2.76

Table S3 Chromatographic data of ginsenosides on the stationary phases. Mobile phase: MeOH/H_2O, 4:6 (v/v), 0.2 mL/min.

Analytes	MIP/SiO_2 SP N/m	T_f	Rs
ginsenoside R1	2690	2.17	-
ginsenoside Rg2	4650	1.66	4.09
ginsenoside Rb1	10420	1.30	2.84
ginsenoside Rb3	9850	0.97	2.45
ginsenoside Rd	11600	1.04	1.51

Table S4 Chromatographic data of nucleosides on the stationary phases. Mobile phase: MeOH/H_2O, 1:99 (v/v), 0.2 mL/min.

Analytes	MIP/SiO_2 SP N/m	T_f	Rs
uridine	5470	2.13	-
2'-deoxyguanosine monohydrate	6950	1.77	1.62
adenosine	8810	1.93	2.29
2'-deoxyadenosine	10510	1.94	1.92
adenine	9620	1.91	1.96

Table S5 Chromatographic data of pesticides on the stationary phases. Mobile phase: MeOH/H_2O, 45:55 (v/v), 0.2 mL/min.

Analytes	MIP/SiO_2 SP N/m	T_f	Rs
imidacloprid	2450	1.10	-
4,6-Dimethyl-N-phenyl-2-pyrimidinamine	3550	0.99	2.19
trlflumuron	4320	0.84	2.07
teflubenzuron	6850	0.95	2.79
pyridaben	7260	1.12	2.12
chlorfluazuron	6070	1.36	4.23