Supporting Information

Magnetic Multiwall Carbon Nanotube Modified with Dual Hydroxy Functional Ionic Liquid for the Solid-phase Extraction of Protein

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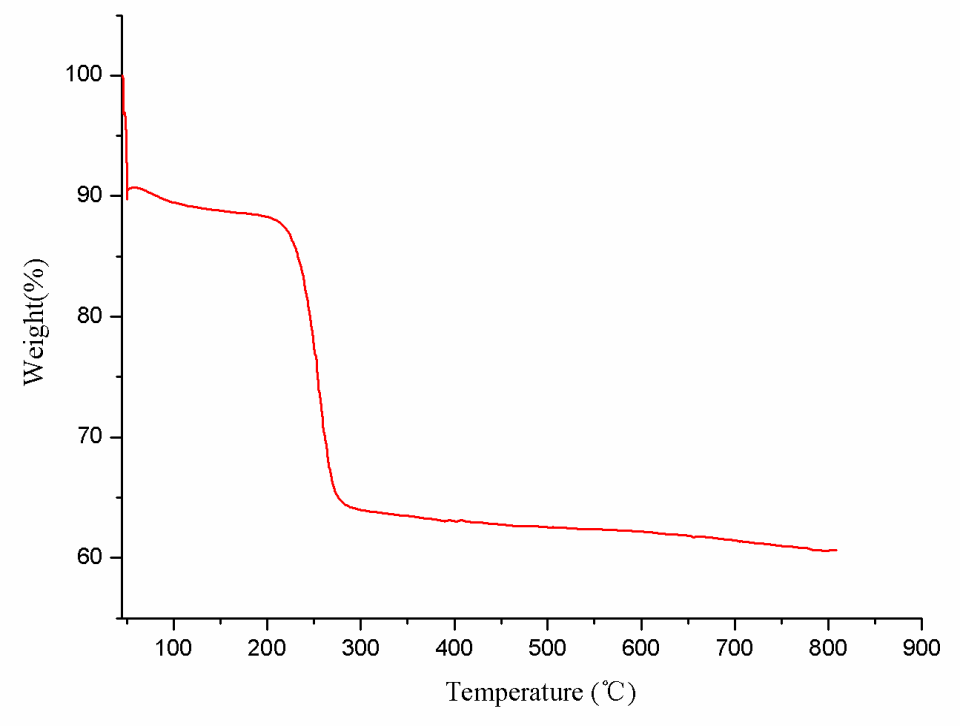


Fig. S1 TGA curves of [OH]-FIL-m-MWCNTs@SiO_2.

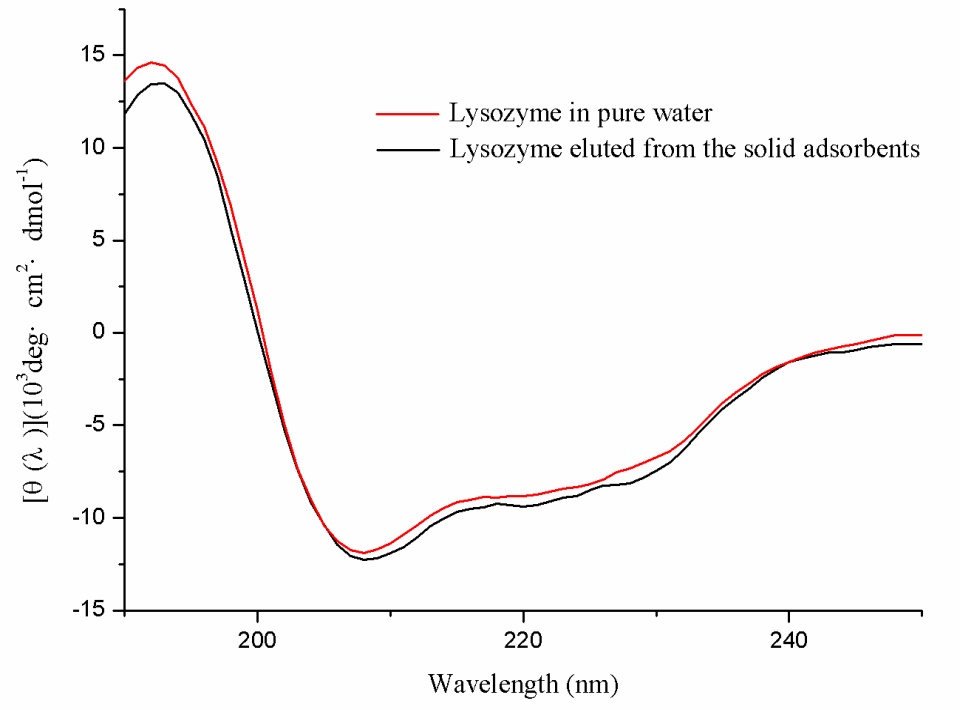


Fig. S2 The CD spectra of Lys in pure water and eluted from the solid adsorbents after

extraction.

Table S1

Table S1a

The types of ILs

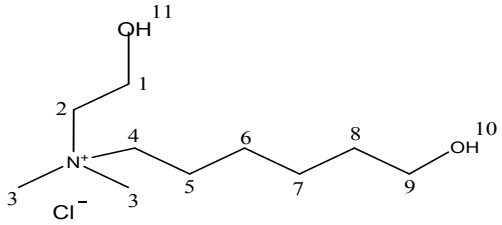
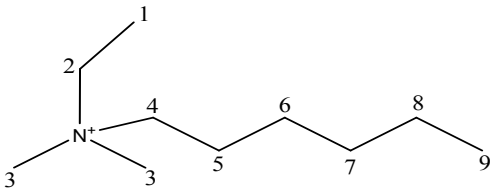
ILs	Cation	Anion
[OH]-FIL		Cl^-
alkly-IL		Cl^-

Table S1b

(A)^{1}H-NMR spectra of the investigated IL

(B) 13C-NMR spectra of the investigated ILs

	(A)^{1}H NMR (δ, ×10^{-6}) [a]		(B)^{13}C NMR (δ, ×10^{-6}) [b]	
	FILs(DMSO)[c]	ILs(DMSO) [c]	FILs(DMSO) [c]	ILs(DMSO) [c]
1	3.809(t, 2H)	1.220(t,3H)	64.912	30.944
2	3.403-3.082(m,2H)	3.374(q,2H)	60.834	58.583
3	3.101(s,6H)	3.031(s,6H)	51.176	62.516
4	3.403-3.082(m,2H)	3.267(t,2H)	55.218	49.589
5	1.416(m,2H)	1.644(m,2H)	26.071	25.729
6	1.317-1.260(m,2H)	1.295-1.238(m,2H)	22.204	22.153
7	1.317-1.260(m,2H)	1.295-1.238(m,2H)	25.401	21.869
8	1.685-1.675(m,2H)	1.295-1.238(m,2H)	32.582	14.090
9	3.403-3.082(m,2H)	0.879(t,3H)	64.388	8.096
10	4.461(s,1H)	-	-	-
11	5.571(s,1H)	-	-	-

[a] Note: ^{1}H-NMR chemical shifts are reported downfield from trimethylsilane (TMS). Multiplicities are abbreviated as s=singlet, d=doublet, quart =quartet, t=triplet and m= multiplet.

[b] Note: ^{13}C-NMR chemical shifts are reported downfield from trimethylsilane (TMS).

[c]The two ILs were recorded on Varian-INOVA 400 NMR spectrometry.

Precision measurement results (n=3)			
Repeats	1	2	3
Extraction amounts (mg/g)	94.5	95.2	94.9
RSD (%)	0.37		
Repeatability measurement results (n=3)			
Sample number	1	2	3
Extraction amounts (mg/g)	94.1	94.9	95.3
RSD (%)	0.47		
Stability measurement results (n=3)			
Day number	1	2	3
Extraction amounts (mg/g)	94.4	95.2	95.3
RSD (%)	0.52		

Table S2 The results of the precision, repeatability and stability experiments