Supplementary Information

Green aqueous biphasic systems containing deep eutectic solvents and sodium salts for the extraction of protein

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Table S1 Freezing point of different molar ratio of ChCl:PEG

Table S2 The extraction efficiencies of DES-Na_2CO_3 with different molar ratio of ChCl and PEG

Table S3 Binodal curve data as the mass fraction w for the DES (1) + salt (2) + H_2O (3) systems at T=298 K

Table S1 Freezing point of different molar ratio of ChCl:PEG

ChCl/PEG	0	1:1	10:1	20:1	30:1
Freezing point (℃)	52	43	39	37	48

Table S2 The extraction efficiencies of DES-Na_2CO_3 with different molar ratio of ChCl and PEG

E (DES-Na_2CO_3)	E_1(%)	E_2(%)	E_3(%)	E_4(%)	E_5(%)
Papain	none	58.91	61.21	80.89	78.59
Bovine serum albumin	none	54.42	76.51	83.5	83.02

E: extraction efficiency. E_1: ChCl/PEG=0; E_2: ChCl/PEG=1; E_3: ChCl/PEG=10; E_4: ChCl/PEG=20; E_5: ChCl/PEG=30.

Table S3 Binodal curve data as the mass fraction w for the DES (1) + salt (2) + H_2O (3) systems at T=298 K

$100w_1$	$100w_2$	$100w_1$	$100w_2$	$100w_1$	$100w_2$	$100w_1$	$100w_2$	$100w_1$	$100w_2$
DES+$Na_3C_6O_5H_7$+H_2O system									
3.65	40.53	8.62	22.69	11.33	16.20	13.00	12.33		
4.31	35.30	8.75	21.97	11.51	15.65	13.21	11.95		
5.49	31.84	9.13	20.98	11.92	14.96	13.56	11.58		
6.41	29.05	9.63	20.09	12.12	14.50				
6.70	27.76	9.78	19.65	12.30	14.17				
7.05	26.03	10.25	18.36	12.68	13.52				
8.12	23.94	10.68	17.60	12.81	13.19				
8.31	23.42	11.09	16.80	12.94	12.81				
DES+NaH_2PO_4+H_2O system									
6.34	37.89	8.55	30.94	10.23	26.62	14.34	18.21	18.14	11.70
6.89	36.06	8.75	30.35	10.82	25.31	14.84	17.08	18.44	11.09
7.20	35.07	8.90	29.95	11.31	24.12	15.57	15.94	18.81	10.60
7.41	34.21	9.17	29.28	11.72	23.37	16.17	14.95	19.19	10.00
7.64	33.45	9.38	28.57	12.24	22.19	16.62	14.11	20.33	8.22
7.85	32.62	9.74	27.95	12.64	21.30	16.88	13.62		
8.19	32.08	9.84	27.55	13.01	20.69	17.38	12.93		
8.37	31.38	10.10	27.02	13.80	19.23	17.79	12.28		
DES+Na_2CO_3+H_2O system									
1.64	40.44	2.37	33.45	3.30	25.87	4.44	18.88		
1.82	38.96	2.47	32.36	3.37	25.36	4.57	17.87		
1.93	37.97	2.52	31.26	3.46	24.74				
2.05	36.49	2.73	30.19	3.56	23.99				
2.17	35.53	2.82	29.59	3.74	22.92				
2.22	34.89	2.90	28.96	3.96	21.45				
2.26	34.40	2.98	28.36	4.10	20.81				
2.32	33.88	3.17	26.78	4.24	19.87				