

Table S1. Phase equilibrium data for the ATPS of E-1006 and (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> at different temperature.

Temperature	Overall composition		E-1006-rich phase composition		(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> -rich phase composition	
	$w_1(\%)$	$w_2(\%)$	$w_1(\%)$	$w_2(\%)$	$w_1(\%)$	$w_2(\%)$
303.15 K	4.00	12.00	3.73	18.33	4.89	1.79
	5.00	14.00	3.37	25.39	5.85	1.68
	6.00	16.00	3.32	32.01	7.72	1.57
	7.00	18.00	2.96	39.62	8.89	1.55
	8.00	20.00	2.39	47.96	10.51	1.53
	9.00	22.00	1.76	55.79	12.29	1.33
313.15 K	4.00	12.00	2.69	27.81	4.89	1.11
	5.00	14.00	2.57	33.91	5.90	1.08
	6.00	16.00	2.19	41.85	7.80	0.79
	7.00	18.00	1.83	48.00	8.96	0.77
	8.00	20.00	1.46	54.32	10.84	0.70
	9.00	22.00	1.09	58.30	12.47	0.66
323.15 K	4.00	12.00	1.75	43.09	5.06	0.88
	5.00	14.00	1.54	47.82	6.05	0.88
	6.00	16.00	1.04	54.75	7.96	0.86
	7.00	18.00	0.93	57.36	9.55	0.83
	8.00	20.00	0.85	58.86	10.94	0.83
	9.00	22.00	0.25	66.35	14.34	0.81

In Table S1,  $w_1$  represents the mass fraction of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> and  $w_2$  represents the mass fraction of E-1006.