

Supplementary table 1. Factors and levels of the single factor experiment

Factors	Levels	Other conditions
Ultrasonic power, W	120, 150, 180, 210, 240	Solid-liquid ratio: 1:30, extraction temperature: 80, extraction time: 2
Extraction time, h	0.5, 1, 1.5, 2, 2.5	Solid-liquid ratio: 1:30, extraction temperature: 80, ultrasonic power: 210
Extraction temperature, °C	60, 70, 80, 90, 100	Solid-liquid ratio: 1:30, extraction time: 2, ultrasonic power: 210
Solid-liquid ratio, g mL ⁻¹	1:10, 1:20, 1:30, 1:40, 1:50	Extraction temperature: 80, extraction time: 2, ultrasonic power: 210

Supplementary table 2. Factors and levels for orthogonal experiment

Levels	Factors			
	Ultrasonic power X ₁ , W	Extraction time X ₂ , h	Extraction temperature X ₃ , °C	Solid-liquid ratio X ₄ , g ml ⁻¹
Low (-1)	150	1.5	70	1:10
Center (0)	180	2	80	1:20
High (1)	210	2.5	90	1:30

Supplementary table 3. Design and the response values for the yields of U-SDF

Run	Ultrasonic	Extraction	Extraction	Solid-liquid	Yield (%)	
	power	time	temperature	ratio	Actual	Predicted
	X ₁ , W	X ₂ , h	X ₃ , °C)	X ₄ , g mL ⁻¹		
1	210	2	80	1:10	6.07	6.13
2	180	2	70	1:30	6.83	6.68
3	150	2	80	1:30	6.32	6.15
4	210	2	90	1:20	5.89	6.03
5	180	1.5	80	1:30	5.52	5.66
6	180	1.5	80	1:10	5.24	5.30
7	150	2	80	1:10	5.86	5.87
8	210	2	70	1:20	5.22	5.49
9	180	2	80	1:20	7.56	7.70
10	180	2	80	1:20	7.55	7.70
11	180	1.5	70	1:20	4.86	4.75
12	180	2	90	1:30	6.87	6.85
13	150	1.5	80	1:20	4.22	4.27
14	180	2.5	90	1:20	5.49	5.48
15	180	2	80	1:20	7.88	7.70
16	180	2.5	80	1:30	5.73	6.06
17	180	2	80	1:20	7.71	7.70
18	150	2	90	1:20	5.38	5.49
19	150	2.5	80	1:20	4.97	4.73
20	180	2	80	1:20	7.81	7.70
21	210	2	80	1:30	6.74	6.61
22	210	2.5	80	1:20	5.32	5.00
23	150	2	70	1:20	5.07	5.32
24	180	2.5	80	1:10	5.41	5.65
25	180	1.5	90	1:20	5.09	4.98
26	180	2.5	70	1:20	5.01	5.01
27	210	1.5	80	1:20	4.73	4.71
28	180	2	90	1:10	6.76	6.65
29	180	2	70	1:10	6.37	6.12