

Supplementary Data

Table S1. Operating variables and experimental results.

Air flow rate (l/h)	Impeller speed (rpm)	MNBs diameter (μm)	particle size (μm)	Recovery (%)
30	600	0	300	20.99
30	600	0	212	35.98
30	600	0	106	65.73
30	700	0	300	22.42
30	700	0	212	43.53
30	700	0	106	67.96
30	800	0	300	27.23
30	800	0	212	45.37
30	800	0	106	71.51
30	900	0	300	28.96
30	900	0	212	47.98
30	900	0	106	74.79
30	1000	0	300	31.65
30	1000	0	212	52.05
30	1000	0	106	75.48
30	1100	0	300	32.43
30	1100	0	212	53.85
30	1100	0	106	77.11
30	1200	0	300	17.99
30	1200	0	212	36.2
30	1200	0	106	68.27
30	1300	0	300	13.02
30	1300	0	212	26.81
30	1300	0	106	64.98
60	600	0	300	17.79
60	600	0	212	32.31
60	600	0	106	61.14
60	700	0	300	21.43
60	700	0	212	37.35
60	700	0	106	66.87
60	800	0	300	24.38
60	800	0	212	44.16
60	800	0	106	70.54
60	900	0	300	25.13
60	900	0	212	45.73
60	900	0	106	71.8
60	1000	0	300	26.51
60	1000	0	212	47.76
60	1000	0	106	74.55
60	1100	0	300	17.62
60	1100	0	212	31.59

60	1100	0	106	70.1
60	1200	0	300	11.11
60	1200	0	212	28.3
60	1200	0	106	60.88
60	1300	0	300	9.98
60	1300	0	212	21.21
60	1300	0	106	58.89
30	600	205	300	27.18
30	600	205	212	49.4
30	600	205	106	84.06
30	700	205	300	37.62
30	700	205	212	62.38
30	700	205	106	86.9
30	800	205	300	47.22
30	800	205	212	67.49
30	800	205	106	93.12
30	900	205	300	48.31
30	900	205	212	70.29
30	900	205	106	94.57
30	1000	205	300	41.13
30	1000	205	212	65.57
30	1000	205	106	88.21
30	1100	205	300	36.15
30	1100	205	212	56.6
30	1100	205	106	80.79
30	1200	205	300	20.81
30	1200	205	212	43.28
30	1200	205	106	77.78
30	1300	205	300	16.15
30	1300	205	212	31.72
30	1300	205	106	68.78
60	600	205	300	23.71
60	600	205	212	47.7
60	600	205	106	83.16
60	700	205	300	30.36
60	700	205	212	53.94
60	700	205	106	87.59
60	800	205	300	35.67
60	800	205	212	64.98
60	800	205	106	90.24
60	900	205	300	45.95
60	900	205	212	66.87
60	900	205	106	92.5
60	1000	205	300	34.78
60	1000	205	212	58.53
60	1000	205	106	84.73

60	1100	205	300	22.5
60	1100	205	212	42.2
60	1100	205	106	75.55
60	1200	205	300	16.54
60	1200	205	212	34.36
60	1200	205	106	70.25
60	1300	205	300	15.67
60	1300	205	212	29.65
60	1300	205	106	61.93
30	600	321	300	31.16
30	600	321	212	56.6
30	600	321	106	86.1
30	700	321	300	39.1
30	700	321	212	64.24
30	700	321	106	89.69
30	800	321	300	48.05
30	800	321	212	70.64
30	800	321	106	94.18
30	900	321	300	49.38
30	900	321	212	74.36
30	900	321	106	95.59
30	1000	321	300	43.42
30	1000	321	212	67.28
30	1000	321	106	91.07
30	1100	321	300	38.63
30	1100	321	212	59.15
30	1100	321	106	84.1
30	1200	321	300	25.64
30	1200	321	212	47.2
30	1200	321	106	82.11
30	1300	321	300	24.01
30	1300	321	212	41.06
30	1300	321	106	70.31
60	600	321	300	25.19
60	600	321	212	46.8
60	600	321	106	84.16
60	700	321	300	31.4
60	700	321	212	57.4
60	700	321	106	88.79
60	800	321	300	45.33
60	800	321	212	66.67
60	800	321	106	91.32
60	900	321	300	49.89
60	900	321	212	68.98
60	900	321	106	93.66
60	1000	321	300	37

60	1000	321	212	64.07
60	1000	321	106	88.43
60	1100	321	300	24
60	1100	321	212	45.7
60	1100	321	106	81.55
60	1200	321	300	20.3
60	1200	321	212	36.91
60	1200	321	106	72.42
60	1300	321	300	16.08
60	1300	321	212	34.88
60	1300	321	106	65.38
30	600	780	300	24.88
30	600	780	212	48.11
30	600	780	106	81.72
30	700	780	300	34.76
30	700	780	212	58.52
30	700	780	106	85.13
30	800	780	300	43.85
30	800	780	212	64.92
30	800	780	106	87.31
30	900	780	300	45.55
30	900	780	212	66.67
30	900	780	106	89.47
30	1000	780	300	36.48
30	1000	780	212	59.57
30	1000	780	106	86.09
30	1100	780	300	34.72
30	1100	780	212	55.79
30	1100	780	106	78.31
30	1200	780	300	19.39
30	1200	780	212	39.76
30	1200	780	106	72.16
30	1300	780	300	14.78
30	1300	780	212	27.74
30	1300	780	106	67.15
60	600	780	300	19.24
60	600	780	212	41.19
60	600	780	106	82.09
60	700	780	300	23.91
60	700	780	212	49.24
60	700	780	106	86.62
60	800	780	300	29.98
60	800	780	212	56.71
60	800	780	106	87.79
60	900	780	300	42.47
60	900	780	212	65.56

60	900	780	106	88.69
60	1000	780	300	27.45
60	1000	780	212	55.09
60	1000	780	106	83.11
60	1100	780	300	21.55
60	1100	780	212	35.53
60	1100	780	106	74.74
60	1200	780	300	13.28
60	1200	780	212	30.65
60	1200	780	106	68.7
60	1300	780	300	12.76
60	1300	780	212	27.66
60	1300	780	106	60.62
