Effects of Sec-octanol and Terpineol on Froth Properties and Flotation Selectivity Index for Microcrystalline Graphite

Xuexia Wang [1,*], Juan Zhang [2], Muhammad Bilal [3], Xiangning Bu [4,*], Yemin Wang [1]

[1] Department of Mining Engineering, Shanxi Institute of Technology, Yangquan 045000, China
[2] Shandong Polytechnic College, Jining 272067, China
[3] Department of Mining Engineering, Balochistan University of Information Technology, Engineering and Management Sciences (BUITEMS), Quetta 87300, Pakistan
[4] Key Laboratory of Coal Processing and Efficient Utilization (Ministry of Education), School of Chemical Engineering and Technology, China University of Mining and Technology, Xuzhou 221116, China
* Correspondence: wangxuexia@sxit.edu.cn, wxuexia1989@163.com (X. W.); xiangning.bu@cumt.edu.cn, xiangning.bu@foxmail.com (X. B.).

Results of recoveries of combustible materials and ash materials for flotation concentrate as well as the first-order rate constants and R_∞

1. Sec-octanol

Table S1 The results of R_c, R_a, K, and R_∞ for sec-octanol

Dosage of sec-octanol / (g/t)	Time / (min)	R_{c1} / (%)	R_{a1} / (%)	K_{I1} / (min^{-1})	$R_{c\infty1}$ / (%)	K_{II1} / (min^{-1})	$R_{a\infty1}$ / (%)
2000	1	24.67	23.53	0.37	73.49	0.37	70.39
	3	47.18	45.05				
	6	66.12	63.23				
3000	1	61.49	57.66	1.04	93.88	1.00	89.82
	3	87.00	82.64				
	6	95.64	91.49				
4000	1	50.21	47.02	0.80	89.28	0.77	85.17
	3	78.94	74.78				
	6	89.87	85.57				
5000	1	59.45	53.75	0.96	96.15	0.88	91.27
	3	90.01	84.22				
	6	96.31	91.19				

Notes: R_c and R_a are the recovery of combustible materials and ash materials for flotation concentrate, respectively;

K_I and K_{II} refer to the first-order rate constant for the combustible materials and the ash materials in the flotation concentrate, respectively;

$R_{c\infty}$ and $R_{a\infty}$ denote the ultimate recovery of combustible materials and ash materials for flotation concentrate, respectively.

Table S2 The results of repeated tests of R_c, R_a, K, and R_∞ for sec-octanol

Dosage of sec-octanol / (g/t)	Time / (min)	R_{c2} / (%)	R_{a2} / (%)	K_{I2} / (min^{-1})	$R_{c\infty 2}$ / (%)	K_{II2} / (min^{-1})	$R_{a\infty 2}$ / (%)
2000	1	27.55	26.26	0.43	69.22	0.42	65.33
	3	46.28	42.82				
	6	65.31	61.63				
3000	1	59.77	55.84	1.01	92.73	1.00	87.05
	3	86.31	80.80				
	6	93.93	88.23				
4000	1	46.10	42.44	0.66	93.63	0.64	87.62
	3	79.59	73.33				
	6	92.50	86.51				
5000	1	63.21	58.95	1.07	95.48	1.03	90.60
	3	90.46	84.94				
	6	96.22	91.58				

2. Terpineol

Table S3 The results of R_c, R_a, K, and R_∞ for terpineol

Dosage of terpineol / (g/t)	Time / (min)	R_{c1} / (%)	R_{a1} / (%)	K_{I1} / (min^{-1})	$R_{c\infty 1}$ / (%)	K_{II1} / (min^{-1})	$R_{a\infty 1}$ / (%)
2000	1	25.23	23.47	0.36	78.03	0.37	70.14
	3	49.40	44.93				
	6	69.41	63.03				
3000	1	52.15	48.55	0.80	92.37	0.78	87.16
	3	81.96	76.79				
	6	92.94	87.65				
4000	1	50.61	46.93	0.78	91.34	0.76	86.09
	3	80.02	74.99				
	6	91.92	86.47				
5000	1	62.28	57.06	1.11	91.54	1.05	86.36
	3	85.58	79.94				
	6	93.48	88.20				

Table S4 The results of repeated tests of R_c, R_a, K, and R_∞ for terpineol

Dosage of terpineol / (g/t)	Time / (min)	R_{c2} / (%)	R_{a2} / (%)	K_{I2} / (min^{-1})	$R_{c\infty 2}$ / (%)	K_{II2} / (min^{-1})	$R_{a\infty 2}$ / (%)
2000	1	25.55	23.92	0.37	77.00	0.37	70.38
	3	49.60	45.58				
	6	69.14	63.61				
3000	1	49.84	46.50	0.80	88.39	0.79	82.85
	3	78.04	72.54				
	6	89.07	83.64				
4000	1	52.25	49.01	0.81	92.90	0.79	88.41
	3	83.01	78.39				
	6	93.16	88.62				
5000	1	62.83	58.62	1.09	93.83	1.06	88.40
	3	88.01	82.31				
	6	95.34	90.04				