

Supplementary Materials: Effects of Metal Ions on the Flotation of Apatite, Dolomite and Quartz

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Table S1. Parameters of C1s on apatite surface treated with various conditions.

Samples	Binding energy/eV	FWHM/eV	Area
Apatite	284.83	1.48	14587.41
	285.79	2.01	4718.30
	288.88	2.13	2295.00
Apatite + Ca ²⁺	284.87	1.52	15319.10
	286.14	1.80	2002.81
	288.86	2.03	1598.09
Apatite + collector	284.88	1.48	19887.01
	285.86	1.93	5283.39
	288.65	1.77	1962.43
Apatite + Ca ²⁺ + collector	284.87	1.61	19837.85
	285.85	1.80	6457.22
	288.62	2.14	2417.09

Table S2. Parameters of C1s on dolomite surface treated with various conditions.

Samples	Binding energy/eV	FWHM/eV	Area
Dolomite	284.89	1.74	10878.46
	286.08	1.77	4446.62
	289.95	1.90	12069.17
Dolomite + Ca ²⁺	284.84	1.47	11565.74
	285.65	2.12	6578.78
	289.83	1.75	12931.99
Dolomite + collector	284.87	1.72	17484.02
	285.89	2.29	6128.91
	289.85	1.83	11290.25
Dolomite + Ca ²⁺ + collector	284.89	1.53	19079.94
	285.77	2.37	6265.15
	289.85	1.67	10789.24

Table S3. Parameters of C1s on quartz surface treated with various conditions.

Samples	Binding energy/eV	FWHM/eV	Area
Quartz	284.79	1.30	9752.47
	285.86	2.11	1033.43
	/	/	/
Quartz + Ca ²⁺	284.84	1.62	10938.72
	286.30	2.07	1649.98
	289.14	1.40	575.96
Quartz + Ca ²⁺ + collector	284.78	1.20	25895.81
	285.67	1.71	3191.73
	288.55	1.38	1453.26