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*Supplement of*

## **Mineral-leaching chemical transport with runoff and sediment from severely eroded rare-earth tailings in southern China**

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NH<sub>4</sub><sup>+</sup> and SO<sub>4</sub><sup>2-</sup> contents and soil textures in the surface soil samples collected in different locations

Locations	NH <sub>4</sub> <sup>+</sup> -N	SO <sub>4</sub> <sup>2-</sup> -S	Particle distribution (%)		
	mg kg <sup>-1</sup>	mg kg <sup>-1</sup>	2-0.05mm	0.05-0.002mm	<0.002mm
A	5.69	34.63	65.24	30.08	4.68
A	5.17	37.37	61.56	34.60	3.84
A	7.15	44.65	60.84	36.12	3.04
A	9.26	40.52	67.76	30.76	1.48
A	5.32	44.90	60.64	33.56	5.80
A	5.97	44.90	58.96	39.16	1.88
A	6.11	39.76	59.28	34.08	6.64
A	4.34	47.66	55.00	42.40	2.60
A	4.69	36.56	58.80	36.88	4.32
A	7.34	35.30	55.56	38.00	6.44
A	6.76	34.44	54.96	42.48	2.56
A	7.10	36.27	68.76	29.56	1.68
A	7.62	40.08	57.68	41.88	0.44
A	8.80	43.58	65.04	32.36	2.60
A	6.07	40.85	53.72	43.84	2.44
A	4.14	45.14	55.64	37.64	6.72
A	11.96	39.76	61.08	34.84	4.08
A	5.11	31.89	59.48	36.88	3.64
A	6.97	47.02	61.80	33.40	4.80
A	5.65	41.40	65.12	32.84	2.04
B	5.71	32.96	92.76	7.04	0.20
B	7.99	27.85	92.32	7.64	0.04
B	8.81	23.38	93.32	6.44	0.24
B	9.36	30.07	90.60	8.84	0.56
B	9.80	22.81	92.20	7.68	0.12
B	7.75	29.15	94.56	5.40	0.04
C	8.13	28.91	88.72	11.12	0.16
C	8.23	36.76	88.84	11.12	0.04
C	8.90	26.59	88.56	10.80	0.64
C	11.98	31.19	90.60	9.00	0.40
C	15.70	24.18	83.92	15.36	0.72
C	10.85	29.15	84.88	14.36	0.76
C	13.95	31.36	74.64	24.56	0.80
C	14.25	33.79	76.20	22.88	0.92
C	13.25	35.88	79.80	19.72	0.48
C	17.49	32.60	82.92	16.36	0.72
C	17.38	35.78	88.36	11.36	0.28
C	16.28	39.12	78.60	20.04	1.36

Dissolved  $\text{NH}_4^+$  and  $\text{SO}_4^{2-}$ 

Sample	Dissolved $\text{NH}_4^+$	Disolved $\text{SO}_4^{2-}$
	$\text{mg L}^{-1}$	$\text{mg L}^{-1}$
5-15 G1	0.64	0.11
5-15 G2	0.54	0.08
5-15 G3	0.68	0.10
5-15 G4	0.71	0.09
5-15 G5	0.65	0.13
5-15 G6	0.74	0.12
5-15 G6	0.70	0.10
5-15 S1	0.66	0.09
5-15 S1	0.80	1.00
5-15 S2	0.69	2.48
5-15 S2	0.67	2.37
5-15 S3	0.97	2.54
5-15 S3	1.61	4.26
5-15 S4	0.79	2.79
5-15 S4	0.75	2.77
5-15 S5	0.79	3.34
5-15 S5	0.75	2.44
5-15 S6	0.65	2.77
5-15 S6	0.65	2.94
5-15 S7	0.84	3.22
5-15 S8	0.58	2.71
5-15 S8	1.12	2.32
5-15 S9	0.85	2.89
5-15 S9	1.49	2.72
5-15 S10	0.91	2.19
5-15 S11	1.07	1.79
5-15 S12	1.04	2.56
5-15 S12	0.86	2.63
5-16 G3	0.70	3.56
5-16 G4	0.54	4.14
5-16 G5	1.16	3.42
5-16 S1	0.89	3.33
5-16 S2	0.79	3.58
5-16 S2	0.67	3.73
5-16 S3	0.80	3.43
5-16 S3	0.97	3.08
5-16 S3	0.99	3.56
5-16 S4	1.65	4.37
5-16 S4	0.65	3.09
5-16 S5	0.96	3.09
5-16 S5	0.95	3.03
5-16 S6	0.88	3.44
5-16 S6	0.87	3.33
5-16 S7	1.35	3.13
5-16 S8	1.60	3.15
5-16 S11	1.05	3.29
5-16 S12	1.11	2.80

Absorbed  $\text{NH}_4^+$  and  $\text{SO}_4^{2-}$ 

Sample	Absorbed	Absorbed
	$\text{NH}_4^+$	$\text{SO}_4^{2-}$
	$\text{mg kg}^{-1}$	$\text{mg kg}^{-1}$
5-15 G1	-	94.18
5-15 G2	-	106.75
5-15 G3	27.29	68.24
5-15 G4	20.28	88.96
5-15 G5	27.24	87.76
5-15 G6	19.99	48.88
5-15 G6	30.63	59.00
5-15 S1	17.71	86.81
5-15 S1	13.57	72.88
5-15 S2	14.21	81.50
5-15 S2	26.09	77.10
5-15 S3	18.96	69.43
5-15 S3	30.23	67.65
5-15 S4	16.12	86.57
5-15 S4	15.38	74.55
5-15 S5	11.80	53.22
5-15 S5	15.96	67.26
5-15 S6	11.99	53.22
5-15 S6	16.69	72.88
5-15 S7	22.50	84.01
5-15 S8	21.48	85.63
5-15 S8	34.02	79.72
5-15 S9	40.65	87.05
5-15 S9	54.82	78.84
5-15 S10	29.05	76.03
5-15 S11	36.28	57.39
5-15 S12	31.44	73.30
5-15 S12	22.92	98.87

"-": Not determined due to the limited sediment sample amount as  $\text{NH}_4^+$  was measured lastly.