

TOWARD A MULTIDISCIPLINARY STRATEGY FOR THE CLASSIFICATION AND REUSE OF IRON AND MANGANESE MINING WASTES

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Table 1S

**Concentration of elements in pots containing blank (BLS) and contaminated (CS) soils,
in volcanic ash (VA) and in granular pumice stone (PS).**

		<i>BLS</i> ₁	<i>BLS</i> ₂	<i>BLS</i> ₃	<i>BLS</i> ₄	<i>CS</i> ₁	<i>CS</i> ₂	<i>CS</i> ₃	<i>PS</i> ₁	<i>PS</i> ₂	<i>PS</i> ₃	<i>VA</i> ₁	<i>VA</i> ₂	<i>VA</i> ₃	<i>VA</i> ₄
As	ppm	9.4	4.4	7.8	6.6	11.6	11.6	12.5	20.0	18.7	20.1	1.2	1.8	1.4	2.1
Bi	ppm	n.d.	0.7	1.2	n.d.	n.d.	n.d.	n.d.	2.7	2.6	2.4	0.7	n.d.	0.3	0.6
Ce	ppm	219.3	27.9	17.4	83.1	146.6	88.0	80.6	284.8	253.4	253.4	41.6	42.8	24.4	35.7
Co	ppm	9.8	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	19.9	18.0	13.4	20.6
Cr	ppm	189.1	131.9	109.3	122.9	130.8	133.8	128.5	50.9	49.0	46.2	19.5	19.6	16.6	20.3
Cu	ppm	89.3	66.5	75.6	63.8	60.2	60.4	59.5	18.9	21.7	26.9	9.3	10.0	8.2	10.0
Fe	%	2.0	1.2	1.3	3.3	14.5	15.1	14.4	2.5	2.7	3.1	0.7	0.7	0.6	0.7
Ga	ppm	5.2	4.6	5.5	5.2	12.1	13.1	11.9	20.9	20.0	20.6	15.1	14.5	11.8	14.9
In	ppm	0.8	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.5	0.4
La	ppm	368.5	32.7	22.4	134.3	163.0	81.3	59.9	182.6	152.2	165.1	28.5	27.9	23.2	25.9
Mn	%	0.288	0.052	0.043	0.900	5.0	4.9	5.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Nb	ppm	n.d.	3.3	3.6	6.3	10.9	10.0	10.2	29.2	27.8	29.1	12.4	12.4	9.0	12.6
Nd	ppm	n.d.	n.d.	n.d.	50.3	264.1	204.3	226.5	13.2	4.0	14.0	n.d.	n.d.	n.d.	n.d.
Ni	ppm	44.0	32.7	36.6	31.3	31.6	43.8	32.5	16.5	17.0	14.0	5.1	4.6	10.7	5.1
P	ppm	3210	2400	2574	2136	1071	791.3	805.3	416.2	255.1	154.5	115.3	135.9	134.7	162.7
Pb	ppm	53.4	34.0	58.1	37.1	56.0	50.3	148.0	86.2	83.1	87.5	30.4	30.2	23.7	30.3
Sb	ppm	26.4	2.8	1.5	8.6	7.6	2.4	2.0	3.4	1.3	2.2	n.d.	n.d.	n.d.	n.d.
W	ppm	6.9	n.d.	n.d.	n.d.	n.d.	11.8	n.d.	6.4	6.1	6.2	1.3	n.d.	n.d.	n.d.
Y	ppm	1134.0	81.1	50.4	410.9	468.7	173.1	132.1	118.5	97.8	69.3	29.4	36.7	22.8	33.7
Yb	ppm	26.1	9.5	9.9	19.4	50.3	45.2	46.7	12.8	12.6	11.8	6.4	4.6	n.d.	5.4
Zn	ppm	228.8	135.2	139.9	311.6	1288.0	1281.0	1376.5	94.7	98.3	94.1	30.9	31.6	25.3	32.6

Subscript numbers refer to replicates of each samples

Table 2S

Average concentration of elements in *CSI-4*⁺, *CSI-4*, mycorrhized sunflower shoots (*Sh*) and roots (*Ro*).

	<i>As</i> (ppm)	<i>Ca</i> (%)	<i>Cr</i> (ppm)	<i>Cu</i> (ppm)	<i>Fe</i> (%)	<i>Ga</i> (ppm)	<i>K</i> (%)	<i>Mn</i> (%)	<i>P</i> (ppm)	<i>Ni</i> (ppm)	<i>Rb</i> (ppm)	<i>S</i> (ppm)	<i>Sr</i> (ppm)	<i>Ti</i> (%)	<i>Zn</i> (ppm)
<i>CSI-4</i> ⁺	23.2 (2.5)	1.05 (0.09)	113.3 (5.9)	64.5 (5.07)	12.18 (0.13)	20.12 (3.99)	2.20 (0.01)	5.55 (0.06)	711 (30)	75.25 (2.99)	80.5 (12.2)	1125 (250)	112.3 (9.9)	0.270 (0.010)	1475 (50)
<i>CSI-4</i>	12.5 (1.2)	1.12 (0.20)	109.8 (15.4)	60.3 (3.3)	11.23 (0.55)	12.88 (1.14)	2.30 (0.08)	4.93 (0.25)	731 (65)	66.95 (4.49)	78.3 (3.0)	1195 (226)	109.8 (6.9)	0.260 (0.020)	1500 (216)
<i>Sh CS</i> ⁺	4.1 (0.1)	2.25 (0.21)	2.8 (0.3)	16.5 (0.7)	0.03 (0.00)	31.50 (13.40)	7.70 (0.57)	0.05 (0.00)	3803 (293)	1.80 (0.14)	116.0 (5.7)	5944 (227)	410.0 (240.0)	0.001 (0.000)	1328 (53)
<i>Sh CS</i> ⁻	1.5 (0.1)	2.06 (0.08)	0.7 (0.1)	14.0 (1.4)	0.03 (0.00)	13.70 (2.26)	7.10 (0.28)	0.05 (0.00)	2878 (222)	1.00 (0.14)	101.5 (3.5)	6189 (227)	253.5 (13.4)	0.002 (0.000)	1410 (55)
<i>Ro CS</i> ⁺	6.5 (0.7)	0.99 (0.03)	29.5 (2.1)	17.5 (0.7)	1.19 (0.90)	25.55 (5.44)	4.65 (0.21)	0.46 (0.03)	1227 (50)	38.00 (2.83)	12.5 (0.7)	16884 (941)	79.0 (5.7)	0.045 (0.003)	1162 (45)
<i>Ro CS</i> ⁻	6.5 (0.7)	2.46 (0.11)	10.0 (1.4)	36.0 (2.8)	2.13 (0.18)	22.00 (1.41)	5.25 (0.21)	0.74 (0.06)	880 (38)	14.00 (1.40)	108.5 (5.0)	13771 (430)	138.0 (9.9)	0.095 (0.007)	1717 (129)