

# Evaluation of Element Mobility in River Sediment Using Different Single Extraction Procedures and Assessment of Probabilistic Ecological Risk

Sanja Sakan <sup>1,\*</sup>, Stanislav Frančišković-Bilinski <sup>2,\*</sup>, Dragana Đorđević <sup>1</sup>, Aleksandar Popović <sup>3</sup>, Nenad Sakan <sup>4</sup>, Sandra Škrivanj <sup>3</sup> and Halka Bilinski <sup>2</sup>

<sup>1</sup> Centre of Excellence in Environmental Chemistry and Engineering–ICTM, University of Belgrade, Njegoševa 12, 11158 Belgrade, Serbia; dragadj@chem.bg.ac.rs

<sup>2</sup> Ruđer Bošković Institute, Division for Marine and Environmental Research, 10000 Zagreb, Croatia; bilinski@irb.hr

<sup>3</sup> Faculty of Chemistry, University of Belgrade, Studentski trg 12–16, 11000 Belgrade, Serbia; apopovic@chem.bg.ac.rs (A.P.); sandra\_skrivanj@chem.bg.ac.rs (S.Š.)

<sup>4</sup> Institute of Physics, University of Belgrade, Pregrevica 118, 11080 Zemun, Serbia; nsakan@ipb.ac.rs

\* Correspondence: ssakan@chem.bg.ac.rs (S.S.); francis@irb.hr (S.F.-B.)

**Table S1.** Relationship between the contents of elements extracted with CaCl<sub>2</sub> and HNO<sub>3</sub> (%).

	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ni	P	Pb	S	Si	Sr	Ti	V	Zn
<b>DN-2</b> <sup>1</sup>	0.01	0.00	0.77	0.00	0.00	0.00	0.00	0.06	0.01	1.39	0.00	1.33	0.24	6.73	0.07	0.01	0.00	9.94	0.71	0.17	0.02	0.00	0.01
<b>IŠ</b>	0.01	0.00	0.95	0.00	0.00	0.08	0.00	0.08	0.01	1.93	0.00	0.82	0.70	7.67	0.23	0.05	0.00	7.57	0.99	1.97	0.00	0.12	0.00
<b>K-4</b>	0.00	0.00	1.35	0.00	0.00	0.00	0.00	0.04	0.00	2.12	0.00	0.17	0.29	4.50	0.10	0.04	0.00	8.31	0.84	0.16	0.00	0.00	0.00
<b>K-2</b>	0.01	0.00	0.85	0.00	0.00	0.00	0.00	0.05	0.01	1.67	0.00	0.33	0.11	6.13	0.09	0.05	0.00	9.79	0.98	0.07	0.00	0.00	0.00
<b>38</b>	0.01	0.00	0.98	0.00	0.00	0.00	0.00	0.05	0.01	1.79	0.00	0.63	0.36	5.29	0.06	0.06	0.00	7.04	0.81	0.93	0.00	0.10	0.00
<b>ČD</b>	0.01	0.00	0.83	0.00	0.00	0.02	0.00	0.13	0.01	1.13	0.00	0.46	0.35	5.92	0.09	0.01	0.00	7.88	0.70	0.17	0.00	0.00	0.02
<b>44</b>	0.01	0.00	0.86	0.00	0.32	0.00	0.00	0.06	0.01	1.97	0.00	0.81	0.14	5.84	0.08	0.05	0.00	8.94	0.94	0.57	0.00	0.00	0.04
<b>51</b>	0.01	0.00	1.16	0.00	0.00	0.02	0.00	0.10	0.01	1.28	0.00	0.52	0.32	6.72	0.10	0.03	0.00	7.28	0.85	1.07	0.00	0.09	0.00
<b>IŠ</b> <sup>2</sup>	0.01	0.00	2.58	0.00	0.00	0.21	0.00	0.04	0.01	1.23	0.00	0.43	0.84	6.19	0.69	0.01	0.00	13.68	0.75	0.00	0.00	0.00	0.07
<b>44</b>	0.20	0.00	0.32	0.00	0.00	0.05	0.12	0.01	0.05	0.45	0.00	0.06	0.80	2.18	0.18	0.03	0.00	0.94	0.39	0.00	0.89	0.00	0.00
<b>45</b>	0.05	1.25	3.53	0.00	0.00	0.00	2.35	0.03	0.01	2.15	0.00	0.06	2.33	2.56	0.50	0.04	0.00	13.28	1.32	0.00	0.00	0.24	0.00
<b>K-2</b>	0.03	0.00	1.41	0.00	0.00	0.10	0.00	0.02	0.01	1.19	0.00	0.06	0.58	1.71	0.12	0.03	0.00	13.30	0.83	0.00	0.00	0.13	0.12
<b>51</b>	0.04	0.00	4.06	0.00	0.00	0.13	0.00	0.01	0.03	1.11	0.00	0.28	0.67	2.13	0.61	0.00	0.00	1.45	0.41	0.00	0.00	0.00	0.00
<b>K-5</b>	0.01	0.00	1.82	0.00	0.00	0.00	0.00	0.06	0.01	0.54	0.00	0.17	0.32	3.00	0.06	0.01	0.00	32.57	0.43	0.00	0.00	0.00	0.02
<b>K-9</b>	0.03	0.00	9.03	0.00	0.00	0.00	0.00	0.13	0.01	5.64	0.00	1.18	0.43	8.17	0.11	0.05	0.00	57.63	1.45	0.00	0.00	0.00	0.21
<b>38</b>	0.03	0.69	1.05	0.00	0.00	0.00	0.00	0.02	0.01	1.17	0.00	0.08	0.26	2.75	0.00	0.03	0.00	22.69	1.23	0.00	0.00	0.00	0.00
<b>52</b>	0.07	0.00	1.37	0.00	0.00	0.16	0.00	0.05	0.02	0.96	0.00	0.91	0.25	3.54	0.28	0.01	0.00	5.92	0.51	0.00	0.04	0.07	0.03
<b>ČD</b>	0.14	0.00	6.79	0.00	0.00	1.25	0.00	0.01	0.04	1.69	0.00	0.12	4.51	1.65	2.89	0.03	0.00	4.43	1.25	0.00	0.49	0.00	0.09
<b>28</b>	0.12	0.00	1.11	0.00	0.00	0.09	0.00	0.03	0.04	0.70	0.00	0.04	0.72	1.90	0.18	0.13	0.00	6.12	0.78	0.00	0.38	0.11	0.05
<b>41</b>	0.04	0.00	2.53	0.00	0.00	0.20	0.00	0.02	0.03	0.78	0.00	0.18	3.32	2.93	1.23	0.00	0.00	6.52	0.87	0.00	0.08	0.34	0.04
<b>49</b>	0.00	0.00	12.13	0.00	0.00	0.00	0.00	0.07	0.01	1.87	0.00	0.92	0.57	4.80	0.30	0.00	0.00	4.46	0.92	0.00	0.00	0.00	0.00
<b>29</b>	0.01	0.00	0.75	0.00	0.00	0.00	0.00	0.04	0.00	0.45	0.00	0.03	0.18	3.50	0.00	0.02	0.00	19.38	0.63	0.00	0.00	0.00	0.00
<b>36</b>	0.01	0.00	7.46	0.00	0.00	0.13	0.00	0.04	0.01	2.97	0.00	0.37	1.92	3.18	0.40	0.03	0.00	3.59	1.90	0.70	0.00	0.00	0.00
<b>K-4</b>	0.03	0.30	1.51	0.00	0.00	0.00	0.00	0.12	0.02	3.15	0.00	0.42	0.05	4.48	0.10	0.16	0.00	158.54	1.13	0.92	0.00	0.07	0.00
<b>DN-2</b>	0.06	0.00	3.58	0.00	1.33	1.26	0.00	0.14	0.03	1.75	0.00	1.46	3.66	7.20	2.11	0.01	0.00	10.39	1.48	0.00	0.09	0.00	1.18

<sup>1</sup>Fine fraction (from DN-2<sup>1</sup> to 51); <sup>2</sup>Coarse fraction (from IŠ<sup>2</sup> to DN).

Table S2. Relationship between the contents of elements extracted with CH<sub>3</sub>COONH<sub>4</sub> and HNO<sub>3</sub> (%)

	Al	As	Ba	Be	Ca	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ni	P	Pb	S	Si	Sr	Ti	V	Zn
DN-2 <sup>1</sup>	0.59	0.00	108	0.00	32.06	17.65	0.24	0.00	3.44	0.14	43.99	2.79	16.12	4.41	113.61	2.55	0.00	0.00	127.13	8.66	73.90	0.07	1.20	2.09
IŠ	0.12	0.00	103	0.00	44.49	27.74	0.33	0.00	3.62	0.00	57.70	2.54	7.07	8.58	119.32	5.58	1.09	0.00	99.12	12.55	80.16	0.00	1.04	1.57
K-4	0.09	0.00	130	0.00	18.61	33.81	1.01	0.00	1.95	0.09	65.58	0.47	3.34	19.21	90.58	8.45	5.14	0.00	103.96	14.47	37.57	0.00	2.92	5.08
K-2	0.14	0.00	153	0.74	16.86	25.82	1.35	0.00	1.79	0.13	66.29	0.45	6.04	15.87	108.14	6.70	5.91	0.00	122.34	20.32	41.49	0.00	4.64	3.76
38	0.08	0.00	131	0.00	27.27	38.06	0.39	0.00	2.57	0.00	74.47	1.12	10.34	16.04	100.56	4.20	5.58	0.00	87.81	13.62	52.94	0.00	1.19	2.18
ČD	0.11	0.00	146	0.00	51.06	32.22	0.78	0.00	4.50	0.07	44.35	2.21	6.54	12.43	111.58	6.25	0.41	0.00	90.41	11.53	74.47	0.00	2.08	5.20
44	0.04	0.00	119	0.00	30.91	33.33	0.32	0.00	2.59	0.10	67.42	1.09	12.99	8.09	101.25	5.09	5.80	0.00	111.04	14.62	50.24	0.00	1.92	1.79
51	0.15	0.00	116	0.00	49.25	25.65	0.25	0.00	3.88	0.04	43.25	2.39	6.87	11.19	103.86	5.33	1.77	0.00	96.82	13.70	82.03	0.00	0.95	3.05
IŠ <sup>2</sup>	0.26	0.00	137	0.00	28.25	2.90	0.46	0.00	3.71	0.00	32.79	1.25	3.52	4.45	101.27	4.16	0.00	0.00	222.38	2.74	56.89	0.00	1.94	1.29
44	0.08	0.00	20	0.00	10.41	8.59	0.11	0.00	1.14	0.00	12.19	0.21	0.98	17.93	56.82	3.97	0.65	0.00	8.74	1.64	21.03	0.00	1.41	0.93
45	1.82	0.00	209	0.00	9.73	42.22	0.58	0.00	1.71	0.23	43.07	0.35	0.68	33.57	42.90	12.38	4.67	0.00	157.98	16.76	26.35	18.17	4.45	5.07
K-2	0.29	0.00	108	0.00	16.89	28.13	0.97	0.00	1.25	0.25	32.82	0.31	0.86	20.69	82.46	9.62	3.71	0.00	118.77	8.16	30.79	0.00	3.66	5.13
51	0.06	0.00	211	0.00	19.85	0.00	0.27	0.00	2.34	0.00	36.17	0.59	2.19	6.34	64.19	6.79	0.00	0.00	24.74	1.99	39.81	0.00	1.45	0.83
K-5	0.19	0.00	74	0.00	45.88	13.73	0.18	0.00	2.25	0.16	14.65	0.61	1.68	13.15	83.33	2.74	0.21	0.00	348.66	3.51	68.54	0.00	1.13	2.73
K-9	0.58	0.00	507	0.00	79.95	44.23	0.76	0.00	6.10	0.27	141.03	1.27	13.27	11.48	218.85	9.57	7.73	0.00	734.21	13.75	169.25	0.00	8.06	25.21
38	0.22	0.00	107	0.00	25.49	100.00	0.17	0.00	2.63	0.05	51.61	0.54	1.54	22.19	120.37	6.91	5.54	0.00	331.69	17.66	59.30	0.00	6.32	12.35
52	0.20	0.00	91	0.00	54.63	5.33	1.01	0.00	4.97	0.00	29.40	1.34	5.96	2.11	73.89	4.21	0.00	0.00	57.68	2.09	85.11	0.00	0.26	4.93
ČD	0.77	0.00	345	0.00	4.86	0.00	1.80	0.00	1.20	0.00	40.46	0.42	0.86	21.09	31.69	15.96	0.00	0.00	39.27	3.99	15.90	0.00	3.05	1.77
28	0.20	0.00	59	0.00	20.05	41.89	0.36	0.00	1.89	0.05	23.54	0.33	0.77	23.82	77.51	6.45	5.23	0.00	111.00	6.06	27.96	0.00	4.38	11.31
41	0.23	0.00	94	0.00	13.55	14.89	0.61	0.00	1.78	0.33	25.54	0.31	1.35	31.93	92.66	9.01	0.00	0.00	87.10	6.42	43.66	0.00	1.72	1.51
49	0.22	0.00	531	5.80	69.39	15.38	0.00	0.00	6.39	0.08	70.82	1.59	4.75	5.42	178.25	4.26	0.00	0.00	59.42	10.27	127.30	0.00	2.74	1.37
29	0.35	0.00	48	0.00	28.03	64.71	1.29	0.00	11.27	0.07	18.64	0.42	0.71	23.57	78.04	8.34	3.05	0.00	231.51	6.40	36.94	0.00	3.12	10.32
36	0.48	0.00	420	2.90	22.85	27.06	0.00	0.00	2.25	0.00	96.31	0.56	2.58	20.54	100.47	9.97	3.61	0.00	52.70	15.60	63.06	0.00	1.91	3.01
K-4	0.23	0.00	164	0.00	55.45	46.15	0.34	0.00	4.48	0.18	93.77	1.02	6.97	5.00	79.50	5.12	11.02	0.00	1656.50	15.16	110.25	0.00	5.29	11.11
DN-2	0.12	0.00	133	0.83	15.30	1.33	0.00	0.00	5.43	0.00	29.01	1.53	6.86	4.04	87.58	4.22	0.00	0.00	126.63	4.28	45.91	0.00	0.49	5.59

<sup>1</sup>Fine fraction (from DN-2<sup>1</sup> to 51); <sup>2</sup>Coarse fraction (from IŠ<sup>2</sup> to DN).

**Table S3.** Relationship between the contents of elements extracted with CaCl<sub>2</sub> and CH<sub>3</sub>COONH<sub>4</sub> (%).

	Al	As	Ba	Be	Ca	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ni	P	Pb	S	Si	Sr	Ti	V	Zn
<b>DN-2</b> <sup>1</sup>	0.59	0.00	108	0.00	32.06	17.65	0.24	0.00	3.44	0.14	43.99	2.79	16.12	4.41	113.61	2.55	0.00	0.00	127.13	8.66	73.90	0.07	1.20	2.09
<b>IŠ</b>	0.12	0.00	103	0.00	44.49	27.74	0.33	0.00	3.62	0.00	57.70	2.54	7.07	8.58	119.32	5.58	1.09	0.00	99.12	12.55	80.16	0.00	1.04	1.57
<b>K-4</b>	0.09	0.00	130	0.00	18.61	33.81	1.01	0.00	1.95	0.09	65.58	0.47	3.34	19.21	90.58	8.45	5.14	0.00	103.96	14.47	37.57	0.00	2.92	5.08
<b>K-2</b>	0.14	0.00	153	0.74	16.86	25.82	1.35	0.00	1.79	0.13	66.29	0.45	6.04	15.87	108.14	6.70	5.91	0.00	122.34	20.32	41.49	0.00	4.64	3.76
<b>38</b>	0.08	0.00	131	0.00	27.27	38.06	0.39	0.00	2.57	0.00	74.47	1.12	10.34	16.04	100.56	4.20	5.58	0.00	87.81	13.62	52.94	0.00	1.19	2.18
<b>ČD</b>	0.11	0.00	146	0.00	51.06	32.22	0.78	0.00	4.50	0.07	44.35	2.21	6.54	12.43	111.58	6.25	0.41	0.00	90.41	11.53	74.47	0.00	2.08	5.20
<b>44</b>	0.04	0.00	119	0.00	30.91	33.33	0.32	0.00	2.59	0.10	67.42	1.09	12.99	8.09	101.25	5.09	5.80	0.00	111.04	14.62	50.24	0.00	1.92	1.79
<b>51</b>	0.15	0.00	116	0.00	49.25	25.65	0.25	0.00	3.88	0.04	43.25	2.39	6.87	11.19	103.86	5.33	1.77	0.00	96.82	13.70	82.03	0.00	0.95	3.05
<b>IŠ</b> <sup>2</sup>	0.26	0.00	137	0.00	28.25	2.90	0.46	0.00	3.71	0.00	32.79	1.25	3.52	4.45	101.27	4.16	0.00	0.00	222.38	2.74	56.89	0.00	1.94	1.29
<b>44</b>	0.08	0.00	20	0.00	10.41	8.59	0.11	0.00	1.14	0.00	12.19	0.21	0.98	17.93	56.82	3.97	0.65	0.00	8.74	1.64	21.03	0.00	1.41	0.93
<b>45</b>	1.82	0.00	209	0.00	9.73	42.22	0.58	0.00	1.71	0.23	43.07	0.35	0.68	33.57	42.90	12.38	4.67	0.00	157.98	16.76	26.35	18.17	4.45	5.07
<b>K-2</b>	0.29	0.00	108	0.00	16.89	28.13	0.97	0.00	1.25	0.25	32.82	0.31	0.86	20.69	82.46	9.62	3.71	0.00	118.77	8.16	30.79	0.00	3.66	5.13
<b>51</b>	0.06	0.00	211	0.00	19.85	0.00	0.27	0.00	2.34	0.00	36.17	0.59	2.19	6.34	64.19	6.79	0.00	0.00	24.74	1.99	39.81	0.00	1.45	0.83
<b>K-5</b>	0.19	0.00	74	0.00	45.88	13.73	0.18	0.00	2.25	0.16	14.65	0.61	1.68	13.15	83.33	2.74	0.21	0.00	348.66	3.51	68.54	0.00	1.13	2.73
<b>K-9</b>	0.58	0.00	507	0.00	79.95	44.23	0.76	0.00	6.10	0.27	141.03	1.27	13.27	11.48	218.85	9.57	7.73	0.00	734.21	13.75	169.25	0.00	8.06	25.21
<b>38</b>	0.22	0.00	107	0.00	25.49	100.00	0.17	0.00	2.63	0.05	51.61	0.54	1.54	22.19	120.37	6.91	5.54	0.00	331.69	17.66	59.30	0.00	6.32	12.35
<b>52</b>	0.20	0.00	91	0.00	54.63	5.33	1.01	0.00	4.97	0.00	29.40	1.34	5.96	2.11	73.89	4.21	0.00	0.00	57.68	2.09	85.11	0.00	0.26	4.93
<b>ČD</b>	0.77	0.00	345	0.00	4.86	0.00	1.80	0.00	1.20	0.00	40.46	0.42	0.86	21.09	31.69	15.96	0.00	0.00	39.27	3.99	15.90	0.00	3.05	1.77
<b>28</b>	0.20	0.00	59	0.00	20.05	41.89	0.36	0.00	1.89	0.05	23.54	0.33	0.77	23.82	77.51	6.45	5.23	0.00	111.00	6.06	27.96	0.00	4.38	11.31
<b>41</b>	0.23	0.00	94	0.00	13.55	14.89	0.61	0.00	1.78	0.33	25.54	0.31	1.35	31.93	92.66	9.01	0.00	0.00	87.10	6.42	43.66	0.00	1.72	1.51
<b>49</b>	0.22	0.00	531	5.80	69.39	15.38	0.00	0.00	6.39	0.08	70.82	1.59	4.75	5.42	178.25	4.26	0.00	0.00	59.42	10.27	127.30	0.00	2.74	1.37
<b>29</b>	0.35	0.00	48	0.00	28.03	64.71	1.29	0.00	11.27	0.07	18.64	0.42	0.71	23.57	78.04	8.34	3.05	0.00	231.51	6.40	36.94	0.00	3.12	10.32
<b>36</b>	0.48	0.00	420	2.90	22.85	27.06	0.00	0.00	2.25	0.00	96.31	0.56	2.58	20.54	100.47	9.97	3.61	0.00	52.70	15.60	63.06	0.00	1.91	3.01
<b>K-4</b>	0.23	0.00	164	0.00	55.45	46.15	0.34	0.00	4.48	0.18	93.77	1.02	6.97	5.00	79.50	5.12	11.02	0.00	1656.50	15.16	110.25	0.00	5.29	11.11
<b>DN-2</b>	0.12	0.00	133	0.83	15.30	1.33	0.00	0.00	5.43	0.00	29.01	1.53	6.86	4.04	87.58	4.22	0.00	0.00	126.63	4.28	45.91	0.00	0.49	5.59

<sup>1</sup>Fine fraction (from DN-2<sup>1</sup> to 51); <sup>2</sup>Coarse fraction (from IŠ<sup>2</sup> to DN).

**Table S4.** Relationship between the contents of elements extracted with CaCl<sub>2</sub> and total element content – BCR extraction (%).

	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ni	P	Pb	S	Si	Sr	Ti	V	Zn
<b>DN-2</b> <sup>1</sup>	0.00	0.00	0.35	0.00	0.03	0.00	0.00	0.02	0.00	0.25	0.00	0.85	0.14	2.52	0.01	0.00	0.00	2.06	0.29	0.11	0.00	0.00	0.00
<b>IŠ</b>	0.00	0.00	0.10	0.00	0.12	0.03	0.00	0.04	0.00	0.29	0.00	0.53	0.35	3.55	0.04	0.00	0.00	1.43	0.52	0.89	0.00	0.01	0.00
<b>K-4</b>	0.00	0.00	0.29	0.00	0.02	0.00	0.00	0.11	0.00	0.46	0.00	0.15	0.15	2.32	0.02	0.00	0.00	2.91	0.43	0.12	0.00	0.00	0.00
<b>52</b>	0.00	0.01	0.33	0.00	0.00	0.00	0.00	0.07	0.00	0.19	0.00	0.18	0.10	1.15	0.01	0.00	0.00	2.92	0.26	0.00	0.00	0.00	0.00
<b>K-2</b>	0.00	0.00	0.15	0.00	0.00	0.01	0.00	0.11	0.00	0.35	0.00	0.29	0.05	2.44	0.01	0.00	0.00	3.81	0.42	0.05	0.00	0.00	0.00
<b>38</b>	0.00	0.00	0.32	0.00	0.05	0.00	0.00	0.06	0.00	0.37	0.00	0.47	0.17	2.26	0.01	0.00	0.00	1.43	0.42	0.68	0.00	0.01	0.00
<b>ČD</b>	0.00	0.00	0.14	0.00	0.04	0.01	0.00	0.07	0.00	0.20	0.00	0.28	0.18	2.08	0.02	0.00	0.00	2.81	0.33	0.10	0.00	0.00	0.01
<b>44</b>	0.00	0.00	0.42	0.00	0.16	0.00	0.00	0.07	0.00	0.46	0.00	0.53	0.07	3.09	0.02	0.00	0.00	2.10	0.47	0.43	0.00	0.00	0.02
<b>51</b>	0.00	0.00	0.18	0.00	0.02	0.01	0.00	0.05	0.00	0.26	0.00	0.33	0.17	2.72	0.02	0.00	0.00	1.04	0.33	0.63	0.00	0.01	0.00
<b>DN-2</b> <sup>2</sup>	0.00	0.00	1.39	0.00	0.43	0.35	0.00	0.04	0.00	0.28	0.00	0.97	1.31	1.67	0.28	0.00	0.00	0.82	0.37	0.00	0.00	0.00	0.21
<b>IŠ</b>	0.00	0.00	1.00	0.00	0.08	0.07	0.00	0.02	0.00	0.16	0.00	0.35	0.21	1.44	0.09	0.00	0.00	0.83	0.21	0.00	0.00	0.00	0.01
<b>K-4</b>	0.01	0.00	0.06	0.00	0.00	0.02	0.01	0.02	0.01	0.08	0.00	0.05	0.29	0.80	0.02	0.00	0.00	0.16	0.12	0.00	0.05	0.00	0.00
<b>52</b>	0.00	0.08	1.44	0.00	0.00	0.00	0.03	0.06	0.00	0.45	0.00	0.06	0.97	1.41	0.05	0.00	0.00	2.50	0.27	0.00	0.00	0.02	0.00
<b>K-2</b>	0.00	0.00	0.56	0.00	0.06	0.03	0.00	0.13	0.00	0.30	0.00	0.08	0.21	0.89	0.02	0.00	0.00	6.53	0.41	0.00	0.00	0.02	0.04
<b>38</b>	0.00	0.00	1.40	0.00	0.01	0.04	0.00	0.02	0.00	0.23	0.00	0.25	0.32	0.88	0.09	0.00	0.00	0.29	0.22	0.00	0.00	0.00	0.00
<b>ČD</b>	0.00	0.00	0.76	0.00	0.00	0.01	0.00	0.03	0.00	0.09	0.00	0.14	0.07	0.79	0.00	0.00	0.00	2.51	0.11	0.00	0.00	0.00	0.00
<b>44</b>	0.00	0.00	2.73	0.00	0.03	0.01	0.00	0.17	0.00	1.04	0.00	0.91	0.14	3.96	0.02	0.00	0.00	12.51	0.34	0.00	0.00	0.00	0.07
<b>51</b>	0.00	0.02	0.43	0.00	0.00	0.00	0.00	0.02	0.00	0.30	0.00	0.08	0.07	0.98	0.00	0.00	0.00	2.17	0.34	0.00	0.00	0.00	0.00
<b>45</b>	0.01	0.00	0.40	0.00	0.00	0.05	0.00	0.02	0.00	0.33	0.00	0.89	0.09	1.55	0.05	0.00	0.00	1.33	0.17	0.00	0.00	0.01	0.01
<b>K-5</b>	0.01	0.01	3.71	0.00	0.05	0.36	0.00	0.07	0.00	0.34	0.00	0.11	1.64	0.88	0.31	0.00	0.00	2.02	0.22	0.00	0.02	0.00	0.02
<b>K-9</b>	0.01	0.00	0.63	0.00	0.04	0.05	0.01	0.14	0.01	0.28	0.00	0.05	0.45	1.30	0.03	0.01	0.00	2.59	0.39	0.00	0.03	0.01	0.02
<b>28</b>	0.00	0.00	1.19	0.00	0.18	0.09	0.00	0.08	0.00	0.24	0.00	0.20	1.71	1.44	0.20	0.00	0.00	2.64	0.36	0.00	0.01	0.05	0.02
<b>41</b>	0.00	0.00	6.28	0.00	0.10	0.00	0.00	0.11	0.00	0.56	0.00	0.96	0.35	2.30	0.06	0.00	0.00	1.30	0.29	0.00	0.00	0.00	0.00
<b>49</b>	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.08	0.00	0.07	0.00	0.03	0.08	1.27	0.00	0.00	0.00	4.49	0.20	0.00	0.00	0.00	0.00
<b>29</b>	0.00	0.00	4.39	0.00	0.14	0.03	0.00	0.17	0.00	1.03	0.00	0.81	0.92	2.27	0.08	0.00	0.00	1.98	0.80	0.76	0.00	0.01	0.00
<b>36</b>	0.00	0.02	0.76	0.00	0.00	0.00	0.00	0.13	0.00	0.68	0.00	0.38	0.01	2.47	0.02	0.00	0.00	10.39	0.65	0.70	0.00	0.01	0.00

<sup>1</sup> Fine fraction (from DN-2<sup>1</sup> to 51); <sup>2</sup> Coarse fraction (from DN-2<sup>2</sup> to 36).

**Table S5.** Relationship between the contents of elements extracted with CH<sub>3</sub>COONH<sub>4</sub> and total element content – BCR extraction (%).

	Al	As	Ba	Be	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ni	P	Pb	S	Si	Sr	Ti	V	Zn
<b>DN-2</b> <sup>1</sup>	0.06	0.00	49.69	0.02	30.65	7.14	0.10	0.00	1.32	0.02	7.95	0.25	10.29	2.50	42.61	0.52	0.00	0.00	26.39	3.52	48.25	0.00	0.14
<b>IŠ</b>	0.01	0.00	10.44	0.00	47.43	11.81	0.13	0.00	1.81	0.00	8.64	0.35	4.53	4.33	55.14	1.04	0.04	0.00	18.64	6.56	35.91	0.00	0.10
<b>K-4</b>	0.01	0.00	27.99	0.04	16.15	17.98	0.39	0.00	4.77	0.01	14.15	0.17	2.95	10.00	46.57	1.21	0.21	0.00	36.41	7.37	28.06	0.00	0.29
<b>52</b>	0.01	0.00	58.32	0.15	18.54	14.80	0.05	0.00	2.98	0.00	8.18	0.29	2.95	5.58	21.45	1.16	0.04	0.00	32.14	4.63	36.70	0.00	0.14
<b>K-2</b>	0.01	0.00	26.26	0.21	18.33	13.52	0.47	0.00	3.90	0.02	13.97	0.19	5.26	6.67	43.01	1.02	0.23	0.00	47.69	8.76	31.82	0.00	0.55
<b>38</b>	0.01	0.00	42.61	0.00	27.87	21.00	0.13	0.00	3.05	0.00	15.59	0.35	7.72	7.60	42.92	0.65	0.24	0.00	17.86	6.98	38.67	0.00	0.14
<b>ČD</b>	0.01	0.00	24.73	0.00	47.50	15.58	0.33	0.00	2.43	0.01	7.71	0.27	3.92	6.38	39.31	1.29	0.02	0.00	32.31	5.38	43.08	0.00	0.18
<b>44</b>	/	0.00	58.47	0.00	26.93	19.87	0.12	0.00	2.99	0.01	15.59	0.34	8.51	3.89	53.49	1.03	0.22	0.00	26.03	7.37	37.85	0.00	0.26
<b>51</b>	0.01	0.00	18.05	0.00	46.58	11.13	0.11	0.00	2.07	0.00	8.89	0.35	4.34	5.96	42.08	1.02	0.06	0.00	13.83	5.26	48.06	0.00	0.10
<b>DN-2</b> <sup>2</sup>	0.06	0.00	49.69	0.02	30.65	7.14	0.10	0.00	1.32	0.02	7.95	0.25	10.29	2.50	42.61	0.52	0.00	0.00	26.39	3.52	48.25	0.00	0.14
<b>IŠ</b>	0.01	0.00	10.44	0.00	47.43	11.81	0.13	0.00	1.81	0.00	8.64	0.35	4.53	4.33	55.14	1.04	0.04	0.00	18.64	6.56	35.91	0.00	0.10
<b>K-4</b>	0.01	0.00	27.99	0.04	16.15	17.98	0.39	0.00	4.77	0.01	14.15	0.17	2.95	10.00	46.57	1.21	0.21	0.00	36.41	7.37	28.06	0.00	0.29
<b>52</b>	0.01	0.00	58.32	0.15	18.54	14.80	0.05	0.00	2.98	0.00	8.18	0.29	2.95	5.58	21.45	1.16	0.04	0.00	32.14	4.63	36.70	0.00	0.14
<b>K-2</b>	0.01	0.00	26.26	0.21	18.33	13.52	0.47	0.00	3.90	0.02	13.97	0.19	5.26	6.67	43.01	1.02	0.23	0.00	47.69	8.76	31.82	0.00	0.55
<b>38</b>	0.01	0.00	42.61	0.00	27.87	21.00	0.13	0.00	3.05	0.00	15.59	0.35	7.72	7.60	42.92	0.65	0.24	0.00	17.86	6.98	38.67	0.00	0.14
<b>ČD</b>	0.01	0.00	24.73	0.00	47.50	15.58	0.33	0.00	2.43	0.01	7.71	0.27	3.92	6.38	39.31	1.29	0.02	0.00	32.31	5.38	43.08	0.00	0.18
<b>44</b>	/	0.00	58.47	0.00	26.93	19.87	0.12	0.00	2.99	0.01	15.59	0.34	8.51	3.89	53.49	1.03	0.22	0.00	26.03	7.37	37.85	0.00	0.26
<b>51</b>	0.01	0.00	18.05	0.00	46.58	11.13	0.11	0.00	2.07	0.00	8.89	0.35	4.34	5.96	42.08	1.02	0.06	0.00	13.83	5.26	48.06	0.00	0.10
<b>45</b>	0.06	0.00	49.69	0.02	30.65	7.14	0.10	0.00	1.32	0.02	7.95	0.25	10.29	2.50	42.61	0.52	0.00	0.00	26.39	3.52	48.25	0.00	0.14
<b>K-5</b>	0.01	0.00	10.44	0.00	47.43	11.81	0.13	0.00	1.81	0.00	8.64	0.35	4.53	4.33	55.14	1.04	0.04	0.00	18.64	6.56	35.91	0.00	0.10
<b>K-9</b>	0.01	0.00	27.99	0.04	16.15	17.98	0.39	0.00	4.77	0.01	14.15	0.17	2.95	10.00	46.57	1.21	0.21	0.00	36.41	7.37	28.06	0.00	0.29
<b>28</b>	0.01	0.00	58.32	0.15	18.54	14.80	0.05	0.00	2.98	0.00	8.18	0.29	2.95	5.58	21.45	1.16	0.04	0.00	32.14	4.63	36.70	0.00	0.14
<b>41</b>	0.01	0.00	26.26	0.21	18.33	13.52	0.47	0.00	3.90	0.02	13.97	0.19	5.26	6.67	43.01	1.02	0.23	0.00	47.69	8.76	31.82	0.00	0.55
<b>49</b>	0.01	0.00	42.61	0.00	27.87	21.00	0.13	0.00	3.05	0.00	15.59	0.35	7.72	7.60	42.92	0.65	0.24	0.00	17.86	6.98	38.67	0.00	0.14
<b>29</b>	0.01	0.00	24.73	0.00	47.50	15.58	0.33	0.00	2.43	0.01	7.71	0.27	3.92	6.38	39.31	1.29	0.02	0.00	32.31	5.38	43.08	0.00	0.18
<b>36</b>	/	0.00	58.47	0.00	26.93	19.87	0.12	0.00	2.99	0.01	15.59	0.34	8.51	3.89	53.49	1.03	0.22	0.00	26.03	7.37	37.85	0.00	0.26

<sup>1</sup> Fine fraction (from DN-2<sup>1</sup> to 51); <sup>2</sup> Coarse fraction (from DN-2<sup>2</sup> to 36).

Table S6. Relationship between the contents of elements extracted with HNO<sub>3</sub> and total element content – BCR extraction (%).

	Al	As	Ba	Be	Ca	Cd	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ni	P	Pb	S	Si	Sr	Ti	V	Zn
<b>DN-2<sub>1</sub></b>	9.3	9.9	45.9	33.1	95.6	40.4	41.0	6.3	39	10.8	16.4	9.0	63.8	56.8	37.5	20.3	2.7	49.8	20.7	40.7	65.2	5.6	11.1	32.9
<b>IŠ</b>	9.3	18.2	10.2	29.7	106.6	43.0	40.8	3.6	50	9.1	12.8	13.8	64.0	50.3	46.2	18.6	4.0	51.8	18.8	52.3	44.9	6.1	9.6	24.9
<b>K-4</b>	8.3	23.7	21.6	33.8	86.8	53.3	37.7	6.3	245	7.9	18.3	36.8	88.3	52.0	51.4	14.4	4.1	51.6	35.2	50.9	74.8	6.7	10.1	34.7
<b>K-2</b>	8.4	18.2	17.1	35.8	108.8	52.0	35.0	7.5	218	12.7	18.5	41.8	87.2	41.9	39.7	15.2	3.8	47.2	39.0	43.1	76.7	7.2	11.9	34.4
<b>38</b>	10.4	12.2	32.6	44.2	102.2	55.4	34.2	41.2	119	13.5	18.6	31.0	74.6	47.4	42.6	15.4	4.3	49.1	20.3	51.4	73.0	10.2	11.8	36.7
<b>ČD</b>	7.9	27.8	16.9	34.0	93.0	48.6	42.3	5.2	54	10.2	15.2	12.2	59.8	51.3	35.2	20.6	4.0	53.1	35.6	46.7	58.0	8.0	8.6	28.3
<b>44</b>	11.0	10.7	49.2	42.4	87.1	59.3	39.4	15.6	115	12.9	20.1	31.0	65.5	48.1	52.8	20.2	3.7	50.4	23.4	50.6	75.2	5.7	13.7	36.5
<b>51</b>	9.4	10.1	15.5	32.0	94.6	43.4	43.6	4.1	53	8.3	18.3	14.5	63.1	53.2	40.5	19.1	3.5	49.2	14.3	38.3	58.5	4.5	10.7	24.8
<b>DN-2<sub>2</sub></b>	6.4	7.3	38.9	24.5	81.6	32.6	28.2	0.8	28	6.1	13.1	9.8	66.6	35.9	23.1	13.5	2.5	43.3	7.9	25.3	59.2	2.4	7.0	18.1
<b>IŠ</b>	5.5	7.6	38.7	18.7	111.8	22.1	34.1	1.7	53	4.8	11.0	14.4	80.6	24.9	23.3	12.9	3.2	20.2	6.1	28.4	68.2	2.2	5.0	14.1
<b>K-4</b>	6.0	18.3	18.6	33.7	70.4	46.6	29.4	6.4	159	11.6	14.5	31.5	75.0	36.6	36.5	14.9	3.3	43.7	17.2	29.9	58.2	6.0	10.2	30.3
<b>52</b>	5.4	6.9	40.8	23.6	104.0	25.1	28.3	1.4	213	8.3	17.2	36.8	95.9	41.7	55.0	10.1	2.3	35.9	18.9	20.2	85.3	2.5	9.1	15.8
<b>K-2</b>	6.6	13.1	39.6	37.8	97.3	45.7	38.3	6.2	203	9.0	20.0	46.6	133.7	36.6	52.3	14.5	2.7	56.7	48.9	49.6	81.0	5.1	12.4	34.6
<b>38</b>	7.9	15.6	34.5	37.6	78.0	47.5	31.4	28.5	189	13.3	16.7	41.0	88.4	47.0	41.4	14.5	3.2	43.9	19.8	52.7	71.9	8.4	10.3	33.4
<b>ČD</b>	4.9	7.8	41.7	19.2	111.3	19.7	26.0	0.8	61	5.1	12.9	16.3	80.3	22.7	26.1	10.9	3.2	28.8	7.7	26.8	79.7	2.3	4.8	10.1
<b>44</b>	6.3	5.9	30.2	23.1	73.2	32.5	27.2	2.2	143	8.7	14.0	41.4	77.2	31.4	48.5	14.2	4.3	33.0	21.7	23.7	76.1	2.2	5.9	33.3
<b>51</b>	4.7	3.0	40.4	17.4	92.2	17.6	21.5	0.1	133	3.8	20.7	31.4	104.9	27.1	35.5	11.0	3.2	20.7	9.5	27.5	77.3	1.6	6.2	14.3
<b>45</b>	13.9	8.6	28.9	32.9	108.8	41.8	32.5	49.8	47	11.8	27.5	44.4	97.4	34.5	44.1	15.5	4.8	41.1	22.5	33.9	79.2	13.1	15.4	39.0
<b>K-5</b>	5.1	6.1	54.9	29.4	87.6	34.0	29.4	1.1	278	7.6	15.5	44.3	87.0	36.3	53.5	10.6	2.3	48.3	45.7	17.9	75.5	3.0	12.3	24.1
<b>K-9</b>	10.1	13.9	57.3	47.4	114.4	67.7	46.5	10.4	214	18.5	32.5	57.2	112.5	62.4	68.2	21.5	4.0	71.8	42.4	50.1	103.7	9.1	15.6	57.0
<b>28</b>	9.9	15.2	46.9	44.1	75.2	55.2	39.0	30.2	240	13.9	24.1	49.3	110.0	51.4	49.4	16.7	4.8	52.6	40.5	41.7	73.3	9.5	11.2	51.1
<b>41</b>	11.2	17.8	51.9	52.9	91.3	51.7	37.0	24.7	148	30.5	22.9	41.8	103.5	62.3	48.0	18.4	3.5	55.2	29.1	31.1	90.1	5.9	11.1	46.3
<b>49</b>	4.9	7.8	53.2	24.8	95.6	28.6	30.1	2.8	192	7.7	12.3	30.4	84.8	43.3	36.3	10.3	2.1	36.8	23.2	32.4	80.6	3.3	7.9	18.0
<b>29</b>	10.5	6.6	58.9	40.7	101.8	50.2	32.9	11.9	258	10.4	26.1	68.2	219.1	47.8	71.4	18.1	3.6	108.2	55.3	42.1	109.4	7.6	9.9	59.2
<b>36</b>	9.6	6.6	50.6	41.1	93.3	49.3	36.2	22.8	105	11.6	17.7	34.5	89.5	31.9	55.0	19.1	2.4	43.6	6.6	57.1	76.0	8.5	12.1	35.2

<sup>1</sup> Fine fraction (from DN-2<sup>1</sup> to 51); <sup>2</sup> Coarse fraction (from DN-2<sup>2</sup> to 36).