## **Supplementary Materials**

**Table S1.** PEPE their concentration ranges in rocks and their mineral phases (data from [5], if not indicated differently)

			Minerals phases				
Possibly	Concentration	Mineral phases with	which may				
environmentally	ranges in rocks	stoichiometric contents of the	incorporate the				
relevant element	(mg/kg)	element	element by				
			substitution				
	4 (granites)-3000		Pyroxenes,				
Cr	(ultramafic	Chromite (Chr) $FeCr_2O_4$	amphiboles, micas,				
CI	(uttrainance rocks)	chionate (chi), recizor	chlorites, spinels,				
	Toersy		garnet, epidote				
	0.2 (sandstones)	Molybdenite (Mol), MoS <sub>2</sub> ,	Scheelite (Sch),				
Мо	–2.6 (shists)	powellite, CaMoO <sub>4</sub> , wultenite,	CaWO <sub>4</sub>				
		PbMoO <sub>4</sub>					
			Magnetite (Mag),				
		and anite Fall O manadinite	resO4, spinels, re-Mg				
	20 (sandstones,	$Ph_{Cl}(VQ)$ , decalorizite	sincates (pyroxenes,				
V	carbonate rocks)	$Pb_5Cl(VO4)_3$ , descripting,	umphiboles), micas;				
	–250 (basalts)	$V_{4}(UO_{4})(VO_{4})$ 2H-O	[46]				
		R2(002)(V04)2.51120	[40] Titanite (Ttn)				
			$C_{a}Ti(O SiO_{4})$ [47]				
			Pvrite (Pv) and				
			Marcasite (Mrc), FeS <sub>2</sub>				
	2 (sandstone)–		pyrrhotite (Po), FeS,				
Ni	2000 (ultramafic	Pentlandite (Pn), (Fe,Ni) <sub>9</sub> S <sub>8</sub>	Fe-Mg-Silicates, e.g.,				
	rocks)		olivine (Ol),				
			(Mg,Fe)2SiO4 [48]				
		Chalcopyrite (Ccp), CuFeS <sub>2</sub> ,					
	1 (carbonata	bornite (Bn), Cu5FeS4, chalcocite					
Cu	4 (Carbonate	(Cct), Cu <sub>2</sub> S, tennantite (Tnt),	Fo Ma cilicator				
Cu	(bacalta)	Cu <sub>6</sub> (Cu <sub>4</sub> (Fe,Zn) <sub>2</sub> )As <sub>4</sub> S <sub>13</sub> ,	re-wig-sincates				
	(Dasalis)	tetrahedrite (Ttr),					
		Cu <sub>6</sub> (Cu <sub>4</sub> (Fe,Zn) <sub>2</sub> )Sb <sub>4</sub> S <sub>13</sub>					
	330 (carbonate		Sheet silicates and				
F	rocks)–735	Fluorite (Fl), CaF2	amphiboles [6]				
	(granites) [6]		ampriboles [6]				

## Table S2. Measurement conditions for EPMA analyses.

Element	Phase	Sample	Analysis Crystal	Standard	LLD (mg/kg)
	ailianta	A-D	_		1258
Е	silicate	Е	- 	fluorito	1053
Г	olivine	С	IAF	nuorite	1162
	titanite	B&D	-		No value
	ailianta	A-D		F-phlogopite	133
Al	silicate	Е	TAP	sanidine	109
	olivine	С	-	F-phlogopite	119

	spinel			albite	100
	titanite	₽¢ D	-	chromite	116
	ilmenite	B&D		corundum	110
	iron oxide	D	-	albite	123
	ailianta	A-D		diopside	234
	silicate –	Е	-	sanidine	227
	olivine	_	-	11 • 4	234
Si	spinel	С	PETJ	albite -	195
	titanite		_	dioposide	179
	ilmenite	B&D	_	orthoclase	200
	iron oxide	D		sanidine	214
	ailianta	A-D			229
	silicate	Е	_		217
	olivine	C	_	magnetite	211
Fe	spinel	C	LIFH	_	268
	titanite	B&D			201
	ilmenite	DQD	_	ilmenite	273
	iron oxide	D		magnetite	302
	cilicato –	A-D	_	_	251
	Silicate	E	_	ilmenite	210
	olivine	C			242
Ti	spinel	C	LIFH	-	323
	titanite	B&D	_	rutilo –	232
	ilmenite		_	-	308
	iron oxide	D			332
	silicate –	A-D	_	diopside	118
		E	-	olivine	136
	olivine	С			115
Mg	spinel		TAP	chromite	145
	titanite	B&D		dolomite	123
	ilmenite	_	_	diopside	122
	iron oxides	D			120
	silicate –	A-D	_	orthoclase	179
Na		E	TAP	sanidine	241
	olivine	<u> </u>	-		137
	titanite	B&D		orthoclase	164
	silicate –	A-D	-		269
	1	E	-	rhodochrosite	284
Ma	olivine	С	DETI	ilmenite -	244
IVIII	spiner		PEIJ		390
	ilmonito	B&D		who donito	240
	iron ovido	Л	-	modonne _	258
	silicato				171
	olivino	A-D	- LIFH	-	171
Ni	eninel	С	IIF	— skutterudite –	1/2
	iron oxide	D	I IFH		No value
	silicate	A-D	LII 11		381
V	olivine		- LIFH	vanadium –	383
•	eninal	С		metal –	475

	titanite				113
	ilmenite	B&D		-	236
	iron oxide	D	_	-	506
	-:1:1-	A-D	DETI		155
	silicate –	Е	- PEIJ	wollastonite -	195
C	olivine	C	PETH	4::4-	85
Ca	spinel	C	PETJ	- alopside -	No value
	titanite		PETH		82
	ilmenite	B&D	PETJ	- wollastonite -	149
	silicate	A-D			
Cu	olivine	C		au anita	No value
Cu	spinel	C	LIFH	cuprite	
	iron oxide	D	_	_	604
	ailianta	A-D			235
	silicate	Е	_	_	No value
C.	olivine	С		-	181
Cr	spinel			chronine	262
	ilmenite	B&D		_	216
	Iron oxide	D			256
	cilicato -	A-D		F-phlogopite	123
V	sincate	Е	DETI	sanidine	108
K	olivine	С	reij	F-phlogopite	125
	titanite	B&D		sanidine	109
	silicate	Е	DETU		
Мо	olivine	С	1 1 111	molybdenum	No voluo
1410	spinel		PETJ	metal	ino value
	titanite	B&D	PETH		
Zn	iron oxide	D	LIFH	willemite	No value

**Table S3.** Mineral phases containing Cr, Cu and Ni (for sample Cn) and Mo (for sample E) and their formation reaction used for hydrogeochemical modelling (Mineral names according to the databases, \_ss: solid solution).

Sample	Mineral	Formation constant (log K)	Formula	Components and stoichiometry of the formation reaction					
		57.100	FeAl <sub>2</sub> O <sub>4</sub>	1 Fe(OH)₄ <sup>-</sup> , 2 Al(OH)₄ <sup>-</sup> , 4 H <sup>+</sup> , 1 e <sup>-</sup> , −8 H <sub>2</sub> O					
		162.100	FeCr <sub>2</sub> O <sub>4</sub>	1 Fe(OH)₄ <sup>-</sup> , 2 CrO <sup>2-</sup> , 12 H <sup>+</sup> , 7 e <sup>-</sup> , −8 H <sub>2</sub> O					
	Spinel_ss	8.528	MgAl <sub>2</sub> O <sub>4</sub>	1 Mg²+, 2 Al(OH)₄⁻, 4 H+, 1 e⁻, − H2O					
		1.186	MgCr <sub>2</sub> O <sub>4</sub>	1 Mg <sup>2+</sup> , 2 CrO <sup>2-</sup> , 8 H+, 6 e <sup>-</sup> , -4 H2O					
Cn		-13.09	Co(OH) <sub>2</sub>	1 Co <sup>2+</sup> , 2 H <sub>2</sub> O					
	TT	-22.80	Ca(OH) <sub>2</sub>	1 Ca <sup>2+</sup> , 2 H <sub>2</sub> O					
	Hydroxide_ss	-18.99	Ni(OH)2	1 Ni <sup>2+</sup> , 2 H <sub>2</sub> O					
		-8.67	Cu(OH)2	1 Cu <sup>2+</sup> , 2 H <sub>2</sub> O					
		73.17	Fe2SiO4	2 Fe(OH)4 <sup>-</sup> , 6 H <sup>+</sup> , 1 H <sub>2</sub> SiO4 <sup>2-</sup> , +2 e <sup>-</sup>					
	Olivine_ss	-14.47	Ca2SiO4 (gamma)	) $2 \operatorname{Ca}^{2+}, 1 \operatorname{H}_2 \operatorname{SiO}_{4^{2-}}$					
		8.70	Ni2SiO4	2 Ni <sup>2+</sup> , 1 H <sub>2</sub> SiO <sub>4</sub> <sup>2-</sup>					

		0.916	Mn <sub>2</sub> SiO <sub>4</sub>	2 Mn <sup>2+</sup> , 1 H <sub>2</sub> SiO <sub>4<sup>2-</sup></sub>					
		-4.82	Mg <sub>2</sub> SiO <sub>4</sub>	2 Mg <sup>2+</sup> , 1 H <sub>2</sub> SiO <sub>4</sub> <sup>2-</sup>					
	MgCrO <sub>4</sub>	-5.3801	MgCrO <sub>4</sub>	1 CrO4 <sup>2-</sup> , 1 Mg <sup>2+</sup>					
	Cuprite	6.786	Cu <sub>2</sub> O	2 Cu <sup>2+</sup> , 2 e <sup>-</sup> , 1 H <sub>2</sub> O, -2 H <sup>+</sup>					
	Chalcopyrite	137.21	CuFeS <sub>2</sub>	1 Cu <sup>2+</sup> , 1 Fe(OH)4 <sup>-</sup> , 20 H <sup>+</sup> , -12 H <sub>2</sub> O, 2 SO4 <sup>2-</sup> . 17 e <sup>-</sup>					
	Ni(OH)2(s)	-12.794	Ni(OH)2	1 Ni <sup>2+</sup> , 2 H <sub>2</sub> O, –2 H <sup>+</sup>					
	Morenosite	2.1449	NiSO4·7H2O	7 H <sub>2</sub> O, 1 Ni <sup>2+</sup> , 1 SO4 <sup>2–</sup>					
	Ni4(OH)6SO4	-32	Ni4[OH]6SO4	-6 H <sup>+</sup> , 6 H <sub>2</sub> O, 4 Ni <sup>2+</sup> , 1 SO <sub>4</sub> <sup>2-</sup>					
	NiCO <sub>3</sub> (s)	6.87	NiCO <sub>3</sub>	1 CO <sub>3</sub> <sup>2–</sup> , 1 Ni <sup>2+</sup>					
	NiS(alpha)	39.26	α-NiS	8 H <sup>+</sup> , -4 H <sub>2</sub> O, 1 Ni <sup>2+</sup> . 1 SO <sub>4</sub> <sup>2-</sup> . 8 e <sup>-</sup>					
	NiS(beta)	44.76	β-NiS	8 H <sup>+</sup> , -4 H <sub>2</sub> O, 1 Ni <sup>2+</sup> , 1 SO <sub>4</sub> <sup>2-</sup> . 8 e <sup>-</sup>					
	NiS(gamma)	46.46	γ-NiS	8 H <sup>+</sup> , -4 H <sub>2</sub> O, 1 Ni <sup>2+</sup> , 1 SO4 <sup>2-</sup> . 8 e <sup>-</sup>					
	Retgersite	2.04	NiSO4·6H2O	6 H <sub>2</sub> O, 1 Ni <sup>2+</sup> , 1 SO <sup>42-</sup>					
	PbMoO <sub>4</sub>	15.620	PbMoO <sub>4</sub>	1 MoO <sub>4</sub> <sup>2-</sup> . 1 Pb <sup>2+</sup>					
	Ag2MoO4(s)	11.55	Ag2MoO4	$2 \text{ Ag}^+$ , $1 \text{ MoO}_4^{2-}$					
	-8(-)			2 Al(OH) <sub>4</sub> <sup>-</sup> , 8 H <sup>+</sup> , -8H <sub>2</sub> O, 3					
	Al2(MoO4)3	43.0085	Al2(MoO4)3	MoO4 <sup>2-</sup>					
	BaMoO <sub>4</sub>	6.9603	BaMoO <sub>4</sub>	1 Ba <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	CaMoO <sub>4</sub> (c)	7.94	CaMoO <sub>4</sub>	1 Ca <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	CaMoO <sub>4</sub> (s)	7.95	CaMoO <sub>4</sub>	1 Ca <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	CuMoO <sub>4</sub>	13.0762	CuMoO <sub>4</sub>	1 Cu <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	CuMoO4(c)	6.48	CuMoO <sub>4</sub>	1 Cu <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	Fe(MoO <sub>4</sub> ) <sub>3</sub> (1)	81.996	Fe(MoO <sub>4</sub> ) <sub>3</sub>	2 Fe(OH)⁴⁻, 8 H⁺, −8 H₂O, 3 MoO₄²⁻					
Е	Fe(MoO <sub>4</sub> ) <sub>3</sub> (2)	82.0755	Fe(MoO <sub>4</sub> ) <sub>3</sub>	2 Fe(OH)4-, 8 H+, -8 H2O, 3 MoO4 <sup>2-</sup>					
	H2MoO4(s)	12.8765	H2MoO4(s)	2 H+, 1 MoO4 <sup>2-</sup>					
	K2MoO4	-3.2619	K2MoO4	2 K <sup>+</sup> , 1 MoO <sub>4</sub> <sup>2–</sup>					
	MgMoO <sub>4</sub> (s)	1.85	MgMoO <sub>4</sub>	1 Mg <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	Mileslag_Mo-AF	20 52515	3CaO·Al2O3·CaMo	2 Al(OH)4 <sup>-</sup> , 4 Ca <sup>+2</sup> , -4 H <sup>+</sup> , 18					
	M[49]	-30.52515	O4·20 H2O	H <sub>2</sub> O, 1 MoO <sub>4</sub> <sup>2–</sup>					
	MnMoO <sub>4</sub> (s)	4.554	MnMoO <sub>4</sub>	1 Mn <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	Мо	19.66965	Мо	8 H⁺, −4 H₂O, 1 MoO₄²⁻, 6 e⁻					
	NiMoO <sub>4</sub>	11.1421	NiMoO <sub>4</sub>	1 Ni <sup>2+</sup> , 1 MoO4 <sup>2-</sup>					
	PbMoO <sub>4</sub>	15.62	PbMoO <sub>4</sub>	1 Pb <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					
	SrMoO <sub>4</sub>	10.2625	SrMoO <sub>4</sub>	1 Sr <sup>2+</sup> , 1 MoO <sub>4<sup>2-</sup></sub>					
	ZnMoO <sub>4</sub>	10.1254	ZnMoO <sub>4</sub>	1 Zn <sup>2+</sup> , 1 MoO <sub>4</sub> <sup>2-</sup>					

Table S4. EPMA of titanite grains (14 spots) in sample B1 (bdl = below detection limit).

Analyte	Average	Minimum	Maximum
		wt %	
SiO <sub>2</sub>	27.87	26.10	28.45
TiO2	32.39	26.31	35.55
Al2O3	3.45	2.20	5.53
Fe <sub>2</sub> O <sub>3</sub>	4.32	2.01	11.32
MnO	0.02	0.03	0.10
MgO	0.81	0.20	2.83
CaO	25.63	20.46	27.40
Na2O	0.02	0.04	0.07
K2O	0.03	0.02	0.06
MoO3	bdl	bdl	bdl

*Minerals* **2019**, *9*, x FOR PEER REVIEW

V2O3	0.23	0.13	0.34
Total	94.78	93.67	95.96

 $5 \ of \ 10$ 

Mineral	<b>Olivine (n = 15)</b>	Serpentine (n = 5)	Tremolite (n = 3)	Chlorite (n = 4)
Analyte		wt %		
SiO <sub>2</sub>	39.52	34.51	53.55	29.50
TiO <sub>2</sub>	bdl	0.05	bdl	0.05
Al <sub>2</sub> O <sub>3</sub>	bdl	0.03	0.54	13.35
$Cr_2O_3$	0.03	bdl	0.31	4.20
FeO	10.06	5.85	1.83	2.60
MnO	0.13	0.09	0.06	0.04
MgO	50.61	36.84	23.64	32.76
CaO	0.02	0.03	12.95	0.03
Na2O	0.03	0.03	0.39	0.03
K <sub>2</sub> O	bdl	0.02	0.03	0.03
NiO	0.26	0.19	0.06	0.16
CuO	bdl	bdl	bdl	bdl
MoO <sub>3</sub>	bdl	bdl	bdl	bdl
$V_2O_3$	0.06	bdl	bdl	0.06
Total	100.72	77.56	93.34	82.81

 Table S5. EPMA (average values) of silicate phases in sample C (bdl = below detection limit).

**Table S6.** Leachable contents of chemical elements of the investigated samples at natural pH (A: quaternary gravel, B: diabase greywacke mixture, C: serpentinite and D: amphibolite breccia; terminology is according to the supplier and not according to scientific rock classification; bold script indicates elements whose leachable contents are regulated in Austrian legislation, red letters indicate values exceeding a limit value, all results are in mg/kg and refer to the dry matter of the solid, considering a solid-to-liquid ratio of 1:10). The estimated extended measurement uncertainty according to the EURACHEM/CITAC guideline is in the range of 30–35% for most elements.

					Α					В					С					D		
Particle size (mm)		Limit value rang e	<2	2–4	4–8	8–11	11– 16	<2	2–4	4–8	8–11	11- 16	<2	2–4	4–8	8–11	11– 16	<2	2–4	4–8	8–11	11- 16
	Na		31	28	21	19	19	29	23	20	19	16	10	12	8	10	7	20	13	13	13	13
	M g		16	10	9	8	6	15	8	9	8	8	115	69	51	47	31	15	10	9	6	7
Main	Al		5	8	4	5	5	8	8	7	8	6	0.7	0.9	0.9	0.7	1.7	4	6	5	11	8
element	Si		22	18	19	20	21	19	19	18	20	19	14	20	22	21	24	23	23	22	26	23
S	Κ		44	36	32	23	19	36	19	23	17	25	10	5	5	14	5	9	6	12	9	13
	Ca		80	79	73	88	64	68	61	87	55	60	38	27	28	28	47	69	75	61	64	76
	Fe		3	<1	<1	6	<1	9	4	3	5	3	<1	2	2	3	2	4	3	2	1	4
	Li		0.06	0.04	0.03	0.03	0.02	0.03	0.01	<0.0 1	0.01	0.01	<0.0 1	0.07	<0.0 1	0.03	<0.0 1	0.01	0.05	0.06	0.02	0.06
	D		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Г		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trace	Ti		0.07	0.04	0.02	0.02	0.01	0.05	0.05	0.05	0.07	0.04	<0.0 1	<0.0 1	0.01	0.02	0.03	0.03	0.06	0.04	0.04	0.16
s	V	1.0	0.15	0.15	0.14	0.14	0.12	0.20	0.18	0.16	0.16	0.15	<0.0 1	<0.0 1	0.01	<0.0 1	<0.0 1	0.17	0.15	0.14	0.13	0.13
	Cr	0.3-1. 0	<0.2 0																			
	M n		0.26	<0.1 0	<0.1 0	<0.1 0	<0.1 0	0.50	<0.1 0	<0.1 0	0.19	0.11	<0.1 0	0.70	<0.1 0	0.28	0.10	0.18	0.47	0.59	0.15	0.65

www.mdpi.com/journal/minerals

Minerals 2019, 9, x FOR PEER REVIEW

Co	1.0	0.01	<0.0 1	<0.0 1	<0.0 1	<0.0 1	0.05	<0.0 1	<0.0 1	<0.0 1	<0.0 1	<0.0 1	0.14	<0.0 1	0.06	0.03	<0.0 1	0.09	0.11	0.02	0.11
Ni	0.4-0. 6	<0.1 0	0.16	<0.1 0	<0.1 0	<0.1 0	<0.1 0	<0.1 0	<0.1 0	<0.1 0	0.27	<0.1 0	0.17	<0.1 0	0.85	1.01	<0.1 0	0.42	0.13	<0.1 0	0.19
Cu	1.0-2. 0	0.13	0.20	<0.0 2	0.02	0.05	0.02	<0.0 2	0.04	0.09	0.08	<0.0 2	0.05	0.05	0.16	1.7	0.14	0.13	0.14	<0.0 2	0.17
Zn		<0.2 0	0.38	<0.2 0	<0.2 0	<0.2 0	0.20	<0.2 0	0.35	<0.2 0	1.15	<0.2 0	0.62	0.73	2.01	5.65	0.42	1.52	0.90	<0.2 0	3.02
Se		1.47	1.38	1.36	1.30	1.26	1.15	1.16	1.13	1.09	1.05	1.04	1.02	<0.1 0	1.01	<0.1 0	<0.1 0	<0.1 0	<0.1 0	<0.1 0	<0.1 0
Sr		0.19	0.21	0.18	0.21	0.15	0.28	0.23	0.27	0.18	0.19	0.14	<0.1 0								
Μ		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D 1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pa		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
٨~		< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Ag		0	0	0	0	0	0	0	0	~											0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cd	0.04	<0.0	<0.0	< <b>0.0</b>	< <b>0.0</b>	< <b>0.0</b>	0.0	0 <0.0	0 < <b>0.0</b>												
Cd	0.04	<0.0 2	<0.0 2	<0.0 2	<0.0 2	<0.0 2	<0.0 2	0 <0.0 2													
Cd Ba	0.04 20	<0.0 2 0.29	<0.0 2 0.10	<0.0 2 0.08	<0.0 2 0.06	<0.0 2 0.10	<0.0 2 0.40	0 <0.0 2 0.18	0 <0.0 2 0.77	0 <0.0 2 0.19	0 <0.0 2 0.13	0 <0.0 2 0.06	0 <0.0 2 0.06	0 <0.0 2 0.04	0 <0.0 2 0.07	0 <0.0 2 0.05	0 <0.0 2 0.05	0 <0.0 2 0.14	0 <0.0 2 0.05	0 <0.0 2 0.25	0 <0.0 2 0.12
Cd Ba W	0.04 20 1.5	<0.0 2 0.29 0.44	<0.0 2 0.10 0.42	<0.0 2 0.08 0.40	<0.0 2 0.06 0.39	<0.0 2 0.10 0.38	<0.0 2 0.40 0.37	<0.0 2 0.18 0.37	0 <0.0 2 0.77 0.37	0 <0.0 2 0.19 0.36	0 <0.0 2 0.13 0.36	0 <0.0 2 0.06 0.36	0 <0.0 2 0.06 0.35	0 <0.0 2 0.04 0.36	0 <0.0 2 0.07 0.35	0 <0.0 2 0.05 0.35	0 <0.0 2 0.05 0.35	0 <0.0 2 0.14 0.34	0 <0.0 2 0.05 0.34	0 <0.0 2 0.25 0.34	0 <0.0 2 0.12 0.34
Cd Ba W Tl	0.04 20 1.5 0.1	<0.0 2 0.29 0.44 <0.0	<0.0 2 0.10 0.42 <0.0	<0.0 2 0.08 0.40 <0.0	<0.0 2 0.06 0.39 <0.0	<0.0 2 0.10 0.38 <0.0	<0.0 2 0.40 0.37 <0.0	<0.0 2 0.18 0.37 <0.0	0 <0.0 2 0.77 0.37 <0.0	0 <0.0 2 0.19 0.36 <0.0	0 <0.0 2 0.13 0.36 <0.0	0 <0.0 2 0.06 0.36 <0.0	0 <0.0 2 0.06 0.35 <0.0	0 <0.0 2 0.04 0.36 <0.0	0 <0.0 2 0.07 0.35 <0.0	0 <0.0 2 0.05 0.35 <0.0	0 <0.0 2 0.05 0.35 <0.0	0 <0.0 2 0.14 0.34 <0.0	0 <0.0 2 0.05 0.34 <0.0	0 <0.0 2 0.25 0.34 <0.0	0 <0.0 2 0.12 0.34 <0.0
Cd Ba W Tl	0.04 20 1.5 0.1	<0.0 2 0.29 0.44 <0.0 1	<0.0 2 0.10 0.42 <0.0 1	<0.0 2 0.08 0.40 <0.0 1	<0.0 2 0.06 0.39 <0.0 1	<0.0 2 0.10 0.38 <0.0 1	<0.0 2 0.40 0.37 <0.0 1	0 <0.0 2 0.18 0.37 <0.0 1	0 <0.0 2 0.77 0.37 <0.0 1	0 <0.0 2 0.19 0.36 <0.0 1	0 <0.0 2 0.13 0.36 <0.0 1	0 <0.0 2 0.06 0.36 <0.0 1	0 <0.0 2 0.06 0.35 <0.0 1	0 <0.0 2 0.04 0.36 <0.0 1	0 <0.0 2 0.07 0.35 <0.0 1	0 <0.0 2 0.05 0.35 <0.0 1	0 <0.0 2 0.05 0.35 <0.0 1	0 <0.0 2 0.14 0.34 <0.0 1	0 <0.0 2 0.05 0.34 <0.0 1	0 <0.0 2 0.25 0.34 <0.0 1	0 <0.0 2 0.12 0.34 <0.0 1

**Table S7.** Leachable contents of chemical elements of the investigated samples at varying pH (C: serpentinite, E: Mo-bearing gneiss; bold script indicates elements whose leachable contents are regulated in Austrian legislation, all results are in mg/kg and refer to the dry matter of the solid, considering a solid-to-liquid ratio of 1:10, bdl: below detection limit). The estimated extended measurement uncertainty according to the EURACHEM/CITAC guideline is in the range of 30 to 35% for most elements.

2 of 10

*Minerals* **2019**, *9*, x FOR PEER REVIEW

## 3 of 10

Sample	C E																		
рН		1.8	3.6	5.1	6.5	8.1	9.7	11.4	12.7	Maximum leaching (% of total content)	1.8	3.8	4.5	6.6	8.1	9.8	11.2	12.7	Maximum leaching (% of total content)
Redox potential (mV)		390	470	433	286	361	391	430	101		644	489	471	413	390	418	287	109	
	Na	4	4	3	3	3	2	-	-	0.49	26	110	19	42	32	26	28	26	0.30
	Mg	7690	6140	5180	2180	96	1200	8	5	3.36	52	16	16	8	6	10	2	52	12.09
Main	Al	8.80	6.50	0.06	0.02	0.07	0.09	0.03	0.27	0.47	49	14	5	1	3	4	17	23	0.16
alamanta	Si	1340	960	840	410	110	290	120	170	0.84	44	12	13	11	13	18	70	44	0.03
elements	Κ	16	31	20	29	95	10	7	15	100	32	18	15	18	22	20	30	32	0.30
	Ca	190	250	340	200	38	150	8	14	4.56	1030	220	270	1100	66	39	61	53	100.00
	Fe	1530	710	420	3	1	1	1	1	2.77	91	19	20	1	1	<1	2	1	3.73
	Li	0.04	0.03	0.03	0.06	0.00	0.01	0.00	0.00	4.14	0.04	0.01	0.01	0.00	0.01	0.00	0.01	0.04	0.93
	Р	0.20	0.16	0.20	0.14	0.14	0.17	0.18	0.39	1.18	12.00	3.80	0.94	0.00	0.00	0.07	0.43	12.00	12.00
	Ti	0.34	0.23	0.21	0.08	0.00	0.05	0.01	0.03	0.51	0.44	0.01	0.01	0.00	0.01	0.01	0.03	0.44	0.21
	V	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.03	0.09	0.07	0.01	0.01	0.00	0.01	0.01	0.02	0.07	1.84
	Cr	2.70	2.30	0.05	0.00	0.00	0.00	0.01	0.02	0.35	0.15	0.01	0.01	0.01	0.01	0.01	0.01	0.05	6.00
	Cr (VI)	<0.5	< 0.5	< 0.5	<0.5	< 0.5	<0.5	<0.5	< 0.5	n.d.	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	n.d.
Traco	Mn	64.00	65.00	55.00	26.00	0.05	3.10	0.02	0.02	6.77	16.00	7.00	7.40	3.00	1.00	0.04	0.08	16.00	23.53
alamanta	Со	5.70	4.80	4.30	1.70	0.01	0.02	0.01	0.01	5.70	0.07	0.03	0.01	0.01	0.00	0.00	0.00	0.07	10.62
cicilicitis	Ni	110.00	83.00	62.00	23.00	0.05	1.10	0.02	0.01	4.26	0.05	0.02	0.03	0.01	0.02	0.01	0.01	0.05	3.76
	Cu	1.80	1.30	0.05	0.00	0.00	0.00	0.00	0.13	4.50	0.52	0.05	0.00	0.00	0.01	0.01	0.03	0.52	7.76
	Zn	1.50	1.30	0.88	0.10	0.08	0.10	0.08	0.08	5.36	2.30	0.32	0.19	0.08	54.00	1.30	0.26	.30	76.67
	As	0.01	0.01	0.01	0.00	0.01	0.01	0.15	0.01	1.81	1.50	0.15	0.14	0.14	0.14	0.14	0.14	0.15	12.00
	Sr	0.19	0.29	0.28	0.35	0.05	0.15	0.01	0.03	21.88	0.84	0.34	0.40	0.16	0.09	0.05	0.15	0.84	5.25
	Mo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<0.01	1.00	1.30	2.90	1.20	1.30	2.50	6.00	1.00	0.01
	Cd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	3.44
	Ba	0.28	0.30	0.29	0.24	0.04	0.32	0.01	0.52	16.25	1.20	0.22	0.17	0.03	0.02	0.03	0.02	0.10	0.80

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4 of 10

	T1	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	n.d.	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
	Pb	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	< 0.01	14.00	0.06	0.02	0.01	0.01	0.01	0.01	14.00	100.00
Anions	F	0.32	0.03	0.13	0.79	1.00	0.63	1.10	0.32	1.28	2.00	0.87	0.78	0.22	0.13	0.39	3.80	0.91	0.02
	C1	2.00	19.00	14.00	25.00	79.00	7.10	6.40	9.40	n.d.	24.00	27.00	5.90	11.00	17.00	25.00	53.00	0.33	n.d.
	$PO_{4^2}$	0.17	0.32	0.26	0.03	0.22	0.17	0.31	0.60	n.d.	9.90	3.70	1.90	1.10	1.10	0.39	1.50	17.00	n.d.
	$SO_4$	0.69	1.40	5.90	4.40	7.40	4.20	12.00	31.00	n.d.	5.20	2.30	6.90	2.30	1.20	12.00	17.00	5.50	n.d.