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Supplement of

Wetland eco-engineering: measuring and modeling feedbacks of oxidation processes between plants and clay-rich material

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1 **Supplement**

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3 **Table S1.** Pore water processes expressed in mole transfers ($\mu\text{mol l}^{-1} \text{ day}^{-1}$) as modeled by PHREEQC with pore water data

4 retrieved at 1 cm below sediment surface. Positive values indicate dissolution, negative values indicate precipitation.

Reactant	Composition	Phase 1. Oxidation (t=0-22)			Phase 2. Initial root development (t=22-64)						Phase 3. Root influence (t=64-176)					
		No plant Mud _{soft}	No plant Mud _{sand}	No plant Clay	No plant Mud _{soft}	Plant	No plant Mud _{sand}	Plant	No plant Clay	Plant	No plant Mud _{soft}	Plant	No plant Mud _{sand}	Plant	No plant Clay	Plant
Calcite	CaCO ₃	267	0.00	120	27.1	48.8	39.3	7.1	0.00	36.9	0.00	25.8	8.13	0.00	0.00	115
Gypsum	CaSO ₄ ·2H ₂ O	0.00	0.00	0.00	-236	-208	0.00	-83.4	-32.1	0.00	-19.2	0.00	-7.59	-14.8	0.00	0.00
Hydroxyapatite	Ca ₅ (PO ₄) ₃ (OH)	-5.00	-3.64	0.00	0.24	0.00	-0.02	-0.04	0.00	0.00	0.18	0.00	0.09	0.00	0.00	0.00
Chalcedony	SiO ₂	-19.1	-15.5	-18.2	0.95	0.71	1.91	-3.37	-1.67	-2.14	0.71	0.00	0.54	1.43	0.00	-0.36
Fe(OH) ₃ (a)	Fe(OH) ₃	-277	-116	-160	0.95	-10.0	0.00	0.00	-21.4	-14.3	-1.34	-4.20	-10.6	-13.3	0.00	-58.5
Pyrite	FeS ₂	270	109	159	0.00	9.76	0.21	3.58	21.2	64.3	0.00	23.8	0.00	13.8	33.3	58.3
Rhodochrosite	MnCO ₃	-11.8	-11.4	-2.27	2.86	1.19	1.23	0.34	-0.24	-0.24	-0.63	-0.89	0.09	0.18	0.00	0.00
CEC	CaX ₂	0.00	20.9	55.5	63.1	41.9	-9.11	0.00	0.00	0.00	2.50	0.00	-9.73	0.00	-9.64	-85.4
	FeX ₂	0.00	0.00	0.00	0.00	0.00	-0.19	-4.11	0.00	-50.2	1.61	-19.8	11.7	0.00	-33.3	0.00
	KX	-8.64	-5.00	-17.7	-4.76	0.00	3.78	-8.30	-6.19	0.00	-2.14	-2.14	-2.77	-7.68	0.00	0.00
	MgX ₂	31.4	-16.8	36.8	-39.8	-30.5	7.42	-1.35	0.00	21.7	-3.04	12.0	0.00	0.00	19.1	39.8
	NaX	-20.9	0.00	-166	-46.4	-25.7	0.00	25.1	25.2	77.6	0.00	19.7	0.00	12.0	49.4	92.9
	NH ₄ X	-33.2	-4.09	0.00	4.76	6.67	0.00	-5.94	-19.0	-20.7	0.00	-1.88	-0.98	-4.20	-1.70	-1.88
H ₂ O (g)	H ₂ O x 10 ³	-3364	-2591	-2364	0.00	0.00	380	-996	-286	-6.67	56.3	49.1	74.1	-357	134	0.00
O ₂ (g)	O ₂	1009	432	659	2.62	45.5	0.00	0.00	41.9	186	0.00	83.6	0.00	44.7	113	215
CO ₂ (g)	CO ₂	-827	-532	-650	35.2	0.00	39.7	0.00	-55.5	-84.8	0.00	-33.1	0.00	44.6	-31.7	-115
No. models found		2	2	2	3	4	2	2	5	2	6	2	1	2	2	1

- 5 **Table S2.** Pore water processes expressed in mole transfers ($\mu\text{mol l}^{-1} \text{ day}^{-1}$) as modeled by PHREEQC with pore water data
 6 retrieved at 11 cm below sediment surface. Positive values indicate dissolution, negative values indicate precipitation.

Reactant	Composition	Phase 1. Oxidation (t=0-22)			Phase 2. Initial root development (t=22-64)						Phase 3. Root influence (t=64-176)					
		No plant Mud _{soft}	No plant Mud _{sand}	No plant Clay	No plant Mud _{soft}	Plant	No plant Mud _{sand}	Plant	No plant Clay	Plant	No plant Mud _{soft}	Plant	No plant Mud _{sand}	Plant	No plant Clay	Plant
Calcite	CaCO ₃	111	59.6	55.2	0.00	19.8	71.7	83.8	27.1	16.2	-3.21	0.00	0.00	0.00	11.5	18.7
Gypsum	CaSO ₄ :2H ₂ O	-72.5	-40.7	-53.4	0.00	-3.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydroxyapatite	Ca ₅ (PO ₄) ₃ (OH)	0.00	0.51	1.45	-0.24	0.00	0.00	0.00	0.00	0.00	0.00	-0.09	0.00	-0.45	0.00	-0.18
Chalcedony	SiO ₂	4.44	5.32	6.74	1.90	3.33	3.10	3.81	1.67	0.95	-0.18	-1.07	-0.27	-3.48	0.00	-1.07
Fe(OH) ₃ (a)	Fe(OH) ₃	0.00	0.00	0.00	-0.24	-6.19	-41.2	-51.2	-25.0	0.00	-0.80	0.00	-1.34	-23.2	-13.8	-8.48
Pyrite	FeS ₂	36.2	21.7	20.1	0.00	0.00	0.00	0.00	0.00	11.9	0.00	4.11	0.00	7.95	0.00	8.57
Rhodochrosite	MnCO ₃	0.00	1.18	0.31	0.00	0.48	1.19	0.95	0.00	0.24	0.00	0.00	0.00	-0.71	0.18	0.09
CEC	CaX ₂	0.00	0.00	0.00	-1.43	-5.95	-50.7	-63.3	-7.86	0.00	1.70	8.39	0.00	0.00	-3.75	0.00
	FeX ₂	-35.5	-20.9	-19.0	0.00	0.00	42.4	51.7	0.00	-11.9	1.07	-3.66	-0.54	15.2	4.29	0.00
	KX	7.00	5.87	3.76	0.00	0.00	2.62	2.86	-5.95	1.67	-0.89	-1.79	0.00	-3.84	0.00	-1.70
	MgX ₂	15.4	13.0	4.87	0.00	4.76	7.14	8.57	8.10	7.38	-1.25	0.00	0.00	-4.11	2.59	5.71
	NaX	25.2	9.95	24.4	0.00	0.00	0.00	5.24	0.00	6.43	-4.29	-4.20	1.96	-12.4	0.00	-5.54
	NH ₄ X	8.12	0.00	0.00	2.86	2.62	0.00	-1.67	5.48	0.95	2.23	-3.39	0.00	-5.80	-2.77	-4.20
H ₂ O (g)	H ₂ O x 10 ³	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-652	0.00	-98.2
O ₂ (g)	O ₂	119	69.5	61.9	0.00	0.00	0.00	0.00	0.00	40.5	0.00	13.6	0.00	32.6	0.00	28.4
CO ₂ (g)	CO ₂	156	0.00	43.0	0.00	0.00	0.00	0.00	0.00	14.5	0.00	0.00	0.00	-67.3	0.00	-13.7
No. models found		2	2	1	4	4	2	2	3	2	1	4	2	4	2	1