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*Soil Research*

### **Supplementary Material**

#### **Chemical and mineralogical factors affecting the kinetics of acid drainage in different geomaterials**

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SUPPLEMENTARY MATERIAL

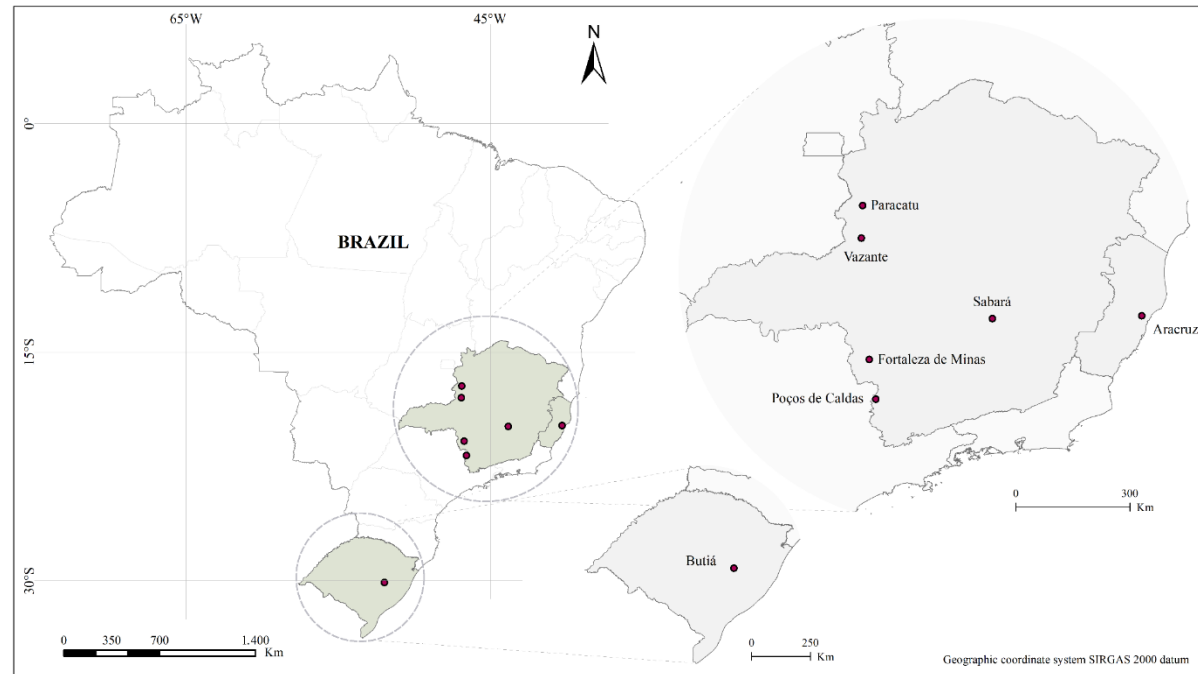


Figure S1: Map of sampling location

Table S1. Interplanar d spacing values corresponding to X-ray diffraction peaks of soil sample minerals.

Sample	Mineral	d / 10 nm														
Whole sample	Muscovite	10.053	4.998	4.476	3.357											
	Kaolinite	7.204	3.588													
	Quartz	4.274	3.353	2.463	2.248	2.128	1.983	1.821	1.674	1.544	1.384	1.377	1.372	1.23	1.201	1.182
	Pyrite	3.123	2.718	2.428	2.214	1.915										
Fine light fraction (<0.05mm)	Muscovite	9.979	3.34	3.32	1.992											
	Kaolinite	7.176	4.382	3.582												
	Quartz	4.257	3.344	2.459	2.282	1.818	1.542	1.374								
Coarse light fraction (>0.05 mm)	Muscovite	9.893	4.972	3.317	2.384	1.993										
	Kaolinite	7.166	4.347	4.158	3.581											
	Quartz	4.256	3.348	2.459	2.285	2.241	2.129	1.824	1.674	1.543	1.384	1.378	1.374	1.259	1.203	1.186
	Rutile	3.251	2.487	2.197	1.692											
Fine dense fraction (<0.05 mm)	Muscovite	9.996	4.987	3.325	3.193	2.993	2.571	1.994								
	Kaolinite	7.191	4.58	4.363	4.187	3.495										
	Quartz	4.262	3.341	2.457	2.283	2.24	1.817	1.672	1.54	1.382	1.375	1.372	1.18			
	Szomolno quite	4.877	3.42	3.138	1.602	2.532										
	Marcassite	3.433	2.712	2.418	1.912	1.436										
	Pyrite	2.422	2.213	1.917	1.635	1.441										
Coarse dense fraction (>0.05 mm)	Muscovite	9.96	4.969	4.47	3.342	3.319	3.194	2.989	2.86							
	Quartz	4.256	3.359	2.463	2.282	2.24	2.127	1.816	1.375							
	Szomolno quite	3.431	3.283	3.12	2.57	2.499	2.241	2.071	2.002							
	Ilmenite	3.719	2.733	2.541	1.861	1.721	1.27									
	Marcassite	3.432	2.709	2.681	1.753	1.716	1.517	1.426								
	Pyrite	3.131	2.709	2.425	2.216	1.918	1.634	1.561	1.502	1.449						

Table S2. Interplanar d spacing values corresponding to the X-ray diffraction peaks of minerals in the coal substrate.

Sample	Mineral	d / 10 nm									
<b>Whole sample</b>	Kaolinite	7,212	4,384	3,584	2,345						
	Szomolnoquite	4,853	3,429	3,132	2,568	2,504					
	Quartz	4,27	2,465	2,289	2,13	1,822	1,672	1,545	1,385	1,378	
	Marcassite	3,441	2,717	1,915	1,757						
	Pyrite	3,075	2,71	2,427	1,636	1,494	1,451				
<b>Light fraction</b>	Kaolinite	7,170	4,38	4,192	3,581	2,499	2,349				
	Muscovite	10,031	4,486	3,361	3,073	2,582	2,565	1,993			
	Quartz	4,274	3,354	2,457	2,282	2,239	2,131	1,820	1,672	1,541	1,375
	Marcassite	3,44	2,72	2,713	2,42	2,312					
	Pyrite	2,709	2,426	2,217	1,915	1,633	1,491				
<b>Dense fraction</b>	Szomolnoquite	4,853	3,431	3,254	3,131	1,600					
	Marcassite	3,46	2,718	2,424	2,324	1,765					
	Pyrite	3,128	2,713	2,426	2,217	1,917	1,635	1,505	1,451	1,215	1,185
	Ilmenite	3,72	1,718	1,858	2,745	2,535	1,459				

Table S3. Interplanar d spacing values corresponding to the X-ray diffraction peaks of the minerals in the phyllite

Sample	Mineral	d / 10 nm										
<b>Whole sample</b>	Muscovite	10.027	4.992	4.478	3.493	3.340	3.201	1.994	2.990	2.860	2.863	2.565
	Kaolinite	7.169	3.581	2.492								
	Quartz	4.257	3.344	2.454	2.280	2.234	2.127	1.979	1.817	1.670	1.540	1.381
	Pyrite	2.705	2.422	1.659	1.628	1.503	1.452					
<b>Light fraction</b>	Muscovite	9.950	4.970	4.490	3.730	3.320	2.990	2.860	2.790	2.570	2.380	1.990
	Kaolinite	7.170	3.700	2.490								
	Quartz	4.260	3.350	2.460	2.280	2.237	2.128	1.980	1.817	1.670	1.660	1.540
	Chlorite-Vermiculite	3.497	4.453	7.816								
	Anorthoclase	3.206	3.245	4.109								
	Siderite	2.795	3.584	1.738	1.732							
	Quartz	4.259	3.342	2.455	2.280	2.125	1.816	1.540	1.138	1.371	1.368	
<b>Dense fraction</b>	Pyrite	3.122	2.704	2.420	2.209	1.913	1.631	1.560	1.500	1.452	1.447	1.209
	Arsenopyrite	2.820	2.428	1.831	1.820							
	Siderite	3.584	1.738	1.732								
	Ilmenite	3.726	3.739	2.555	1.870							

Table S4: Interplanar d spacing values corresponding to the X-ray diffraction peaks of the minerals in the dolomite substrate

Mineral	d/10mm
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<b>Sample</b>	
	Quartz-1 4.256 3.35 2.46 2.286 2.24 1.544
<b>Whole sample</b>	Dolomite 3.705 2.893 2.676 2.547 2.41 2.197 2.069 2.02 1.849 1.808 1.790 1.570 1.547 1.466 1.434 1.391 1.334 1.69
	Pyrite-8 2.709 2.421 1.632 1.449 1.205 1.112
<b>Light fraction</b>	
	Quartz-1 4.254 3.343 2.46 2.282 2.237 2.13 1.98 1.82 1.674 1.543 1.383 1.376 1.372 1.256 1.201
<b>Dense fraction</b>	
	Pyrite-8 3.133 2.715 2.428 2.212 1.919 1.634 1.566 1.504 1.448 1.213

Table S5: Interplanar spacing d values corresponding to the X-ray diffraction peaks of the minerals in the shale substrate.



Table S6: Interplanar spacing d values corresponding to the X-ray diffraction peaks of the minerals in the alkaline rock

<b>Sample</b>	<b>Mineral</b>	<b>d / 10 nm</b>											
<b>Whole sample</b>	Pyrite	2.765	2.420	2.240	1.931	1.652	1.502						
	Microcline	6.472	4.220	3.801	3.330	3.484	3.286	3.238	2.977	2.902			
	Ortoclase	4.220	3.769	3.314	3.471	2.993	2.901	2.571					
	Kaolinite	7.135	3.435	4.160	3.566	2.350							
	Muscovite	9.930	3.323	2.567	1.993	2.861							
	Anorthoclase	6.490	3.247	3.211	2.162	2.930							
	Nepheline	4.980	3.270	2.997	2.872	2.566	2.393	2.340	2.080	1.930	1.795	1.622	1.561
<b>Light fraction</b>	Microcline	6.490	4.220	3.800	3.480	3.290	3.330	3.240	2.970	2.900			
	Muscovite	9.950	4.475	3.360	3.330	2.565	2.580	2.156					
	Nepheline	3.270	3.000	2.880	2.340	1.794							
<b>Dense fraction</b>	Microcline	4.251	3.812	3.330									
	Pyrite	3.131	2.711	2.426	2.217	1.916	1.634	1.566	1.503	1.448	1.213	1.184	





Table S8: Interplanar spacing d values corresponding to the X-ray diffraction peaks of the minerals in the pyrite (standard)

Sample	Mineral	d / 10 nm													
Whole sample	Pyrite	3.128	2.711	2.427	2.215	1.917	1.635	1.566	1.504	1.449	1.243	1.214	1.182	1.158	1.106