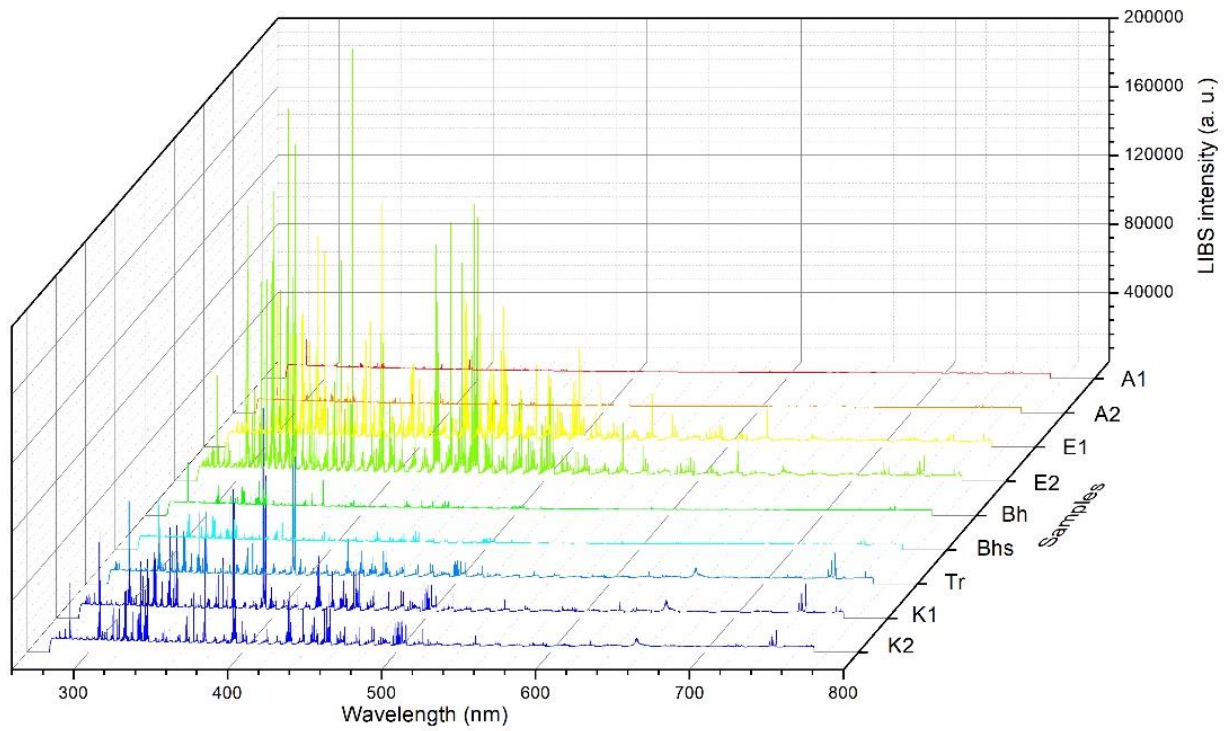


## Supporting Materials

### Characterization of an Amazon soil profile by laser-induced breakdown, Raman, and fluorescence spectroscopies



**Figure S1.** Average LIBS spectra in the VIS region of soil samples from all horizons.

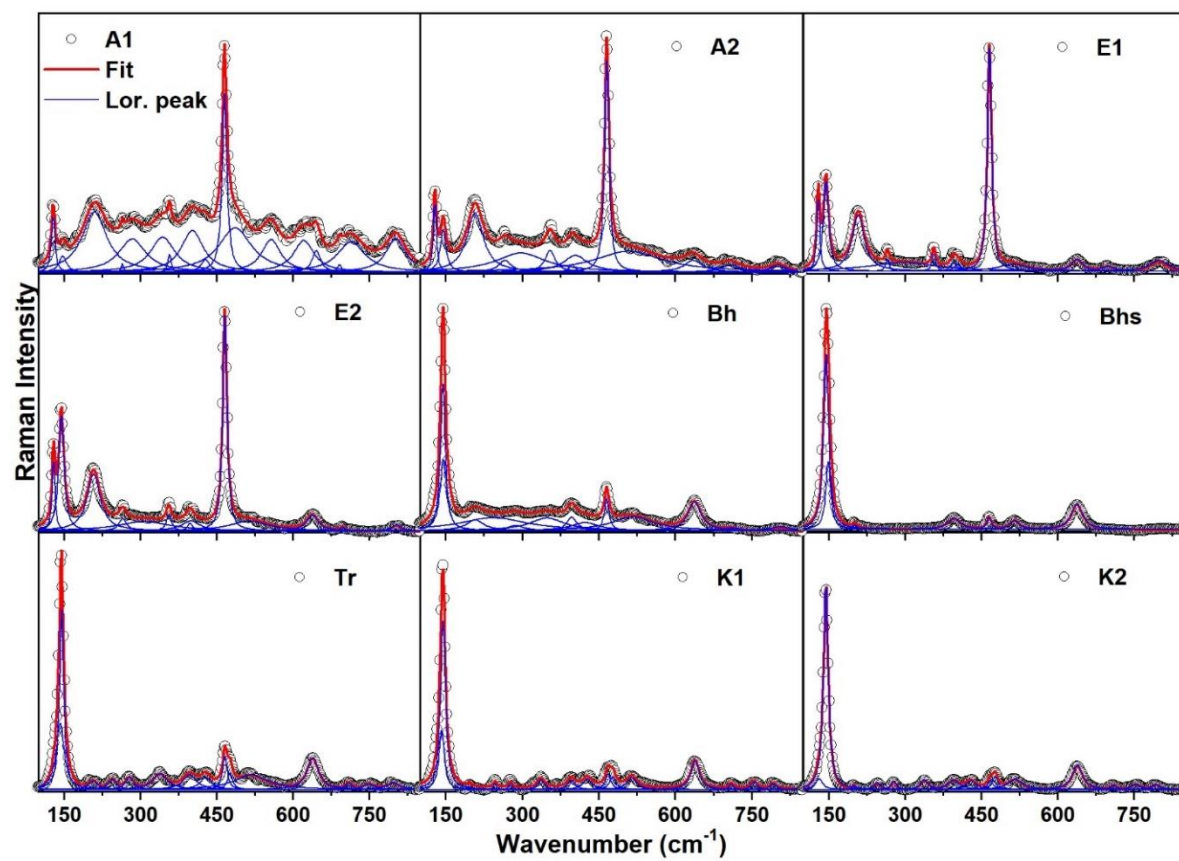
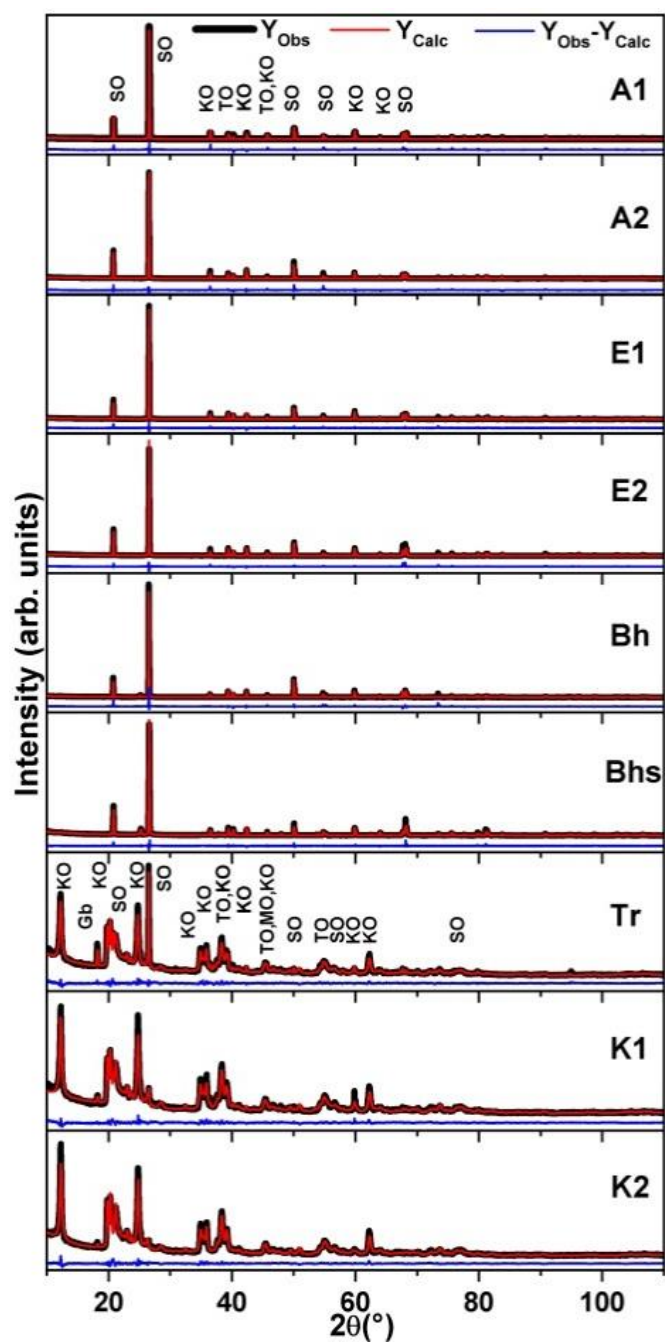


Figure S2. Deconvoluted spectra resolved from curve-fitting and fitted spectrum from different layers.



**Figure S3.** Rietveld refinement of their XRPD patterns. SO quartz, KO kaolinite, Gb gibbsite, TO titanium oxide (anatase), MO muscovite. (Adapted from Huaman [4]). Copyright 2021, with permission from Springer.

**Table S1.** Raman wavenumbers (cm<sup>-1</sup>) were observed for quartz (SO), kaolinite (KO), gibbsite (Gb), anatase (TO), and muscovite (MO) from different layers.

[illegible]

Bh				Bhs				Tr				K1			
	$\omega$ (cm <sup>-1</sup> )	FWHM (cm <sup>-1</sup> )	M <sub>I</sub> (a.u)		$\omega$ (cm <sup>-1</sup> )	FWHM (cm <sup>-1</sup> )	M <sub>I</sub> (a.u)		$\omega$ (cm <sup>-1</sup> )	FWHM (cm <sup>-1</sup> )	M <sub>I</sub> (a.u)		$\omega$ (cm <sup>-1</sup> )	FWHM (cm <sup>-1</sup> )	M <sub>I</sub> (a.u)
TO	144.63	11.07	0.373	TO	144.82	11.85	0.240	TO	142.17	18.99	0.033	TO	142.20	12.07	0.030
KO	145.69	15.34	0.181	KO	149.04	11.71	0.092	KO	144.89	9.84	0.090	KO	144.95	11.41	0.08
SO	207.46	42.25	0.027	TO	201.83	12.01	0.006	SO	206.94	22.74	0.004	TO	197.57	3.73	0.001
KO	243.77	159.85	0.032	KO	396.46	31.79	0.015	KO	244.71	20.51	0.005	KO	247.20	7.24	0.003
KO	287.43	39.17	0.0134	SO	465.08	11.30	0.016	MO	278.50	20.14	0.006	MO	277.15	8.70	0.002
KO	348.63	83.22	0.0322	TO	515.38	23.10	0.012	KO	338.33	36.66	0.007	KO	336.92	15.76	0.005
KO	397.09	24.59	0.034	TO	638.01	26.91	0.034	KO	396.72	33.32	0.007	KO	396.19	17.66	0.004
KO	422.99	66.69	0.020	SO	802.69	20.30	0.002	KO	428.30	26.90	0.006	KO	427.93	22.90	0.005
SO	465.65	11.04	0.082					SO	466.06	10.93	0.017	SO	468.34	13.24	0.007
TO	516.28	99.29	0.035					Gb	476.23	12.17	0.008	Gb	477.66	15.52	0.006
TO	637.90	31.56	0.072					TO	517.79	83.09	0.007	TO	514.76	24.01	0.006
KO	711.14	36.27	0.006					TO	638.85	27.78	0.015	TO	638.86	20.32	0.014
SO	805.89	42.30	0.010					KO	709.64	16.96	0.003	KO	709.46	12.04	0.002
								KO	749.66	31.57	0.002	KO	754.63	14.05	0.003
								KO	797.45	34.41	0.003	KO	792.69	16.19	0.002

	K2		
	$\omega$ (cm <sup>-1</sup> )	FWHM (cm <sup>-1</sup> )	M <sub>I</sub> (a.u)
SO	130.94	17.59	0.005
KO	144.35	11.15	0.103
TO	199.42	8.42	0.002
KO	244.93	15.25	0.003
MO	277.69	12.09	0.004
KO	337.98	19.67	0.004
KO	395.60	28.72	0.004
KO	429.04	25.68	0.004
SO	467.21	14.23	0.004
Gb	477.32	13.38	0.006
TO	516.35	35.14	0.005
TO	638.91	25.12	0.012
KO	709.76	15.76	0.002
KO	753.95	24.84	0.002
KO	793.20	22.33	0.002