

	BS1	BS2	PAL 1	PAL 2	T11 C	T11L	T12	T20	T20_1	T21	T76 C	T76L	T109 C	T110 C	T110 C_1	T210	T210 L	T314 C	T314 L	TN2	TN3	TN4	TN5	Vibrational assignments	Mineralogical phase		
Infrared peaks (cm <sup>-1</sup> )							3360	3408		3349										3517			3541	O-H stretching	Gypsum		
																				3399		3360	3401	O-H stretching	Water/Gypsum		
	2516	2514	2513	2512	2516	2515	2508	2515	2516	2512	2518	2514	2512	2517	2513	2516	2516	2516	2512	2507	2515	2509	2513	Combination mode in CO <sub>3</sub> <sup>2-</sup>	Carbonates		
	1794	1794	1795	1794	1794	1795	1795	1794	1795	1795	1794	1794	1794	1795	1795	1794	1794	1794	1795	1795	1795	1795	1795	Combination mode in CO <sub>3</sub> <sup>2-</sup>	Carbonates		
																					1681				O-H bending	Gypsum	
	1647	1658					1637	1650			1647												1641		O-H bending	Water	
																							1619		1620	O-H bending	Gypsum
	1406	1405	1406	1405	1406	1407	1412	1406	1406	1409	1408	1410	1407	1405	1406	1409	1410	1408	1407	1395	1404	1403	1407	C-O asymmetric stretching	Carbonates		
	1160	1164			1160	1160		1145	1161	1163	1162											1163	1163		Si-O-Si stretching	Silicates	
																					1114			1123	S-O asymmetric stretching	Gypsum	
			1083	1083			1082	1086			1080	1084	1083	1085	1084	1086	1084	1082	1082						Si-O-Si stretching	Quartz/Silicates	
	1035	1022	1039			1037				1023	1035	1037										1024	1026		Si-O-Si stretching	Silicates	
	872	871	872	871	872	872	872	872	872	872	872	872	872	872	872	872	872	872	872	872	871	872	871	872	Out-of-plane bending in CO <sub>3</sub> <sup>2-</sup>	Carbonates	
											797	797	797												Si-O-Si stretching	Quartz	
											779	779	779												Si-O bending	Quartz	
	712	712	712	711	712	712	712	712	712	711	712	712	712	712	712	712	711	712	712	711	712	712	712	712	In-plane bending in CO <sub>3</sub> <sup>2-</sup>	Carbonates	
																					670			671	S-O bending	Gypsum	
												647									600			602	S-O bending	Gypsum	
								604				588													Al-O-Si bending	Silicates	
		532					540			533		526													Al-O-Si bending	Silicates	
457	469	473			473	467	472		464	468	464	468	469	461	466	465	459	462	467	447	459	472	O-Si-O bending	Silicates			

**S1 Table. Infrared data.** Infrared peaks obtained by ATR-FTIR analyses and vibrational assignments.