

Supporting Information for

**SEISMICALLY TRIGGERED ANOXIA AND BRINE SPILLOVER DURING
THE CE 365 CRETE MEGA-EARTHQUAKE IN THE EASTERN
MEDITERRANEAN SEA**

SM7

MINERALOGY

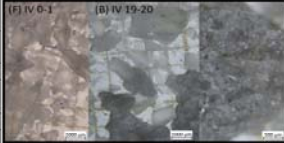
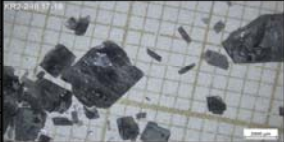


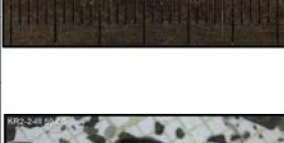


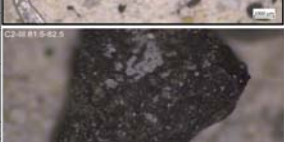
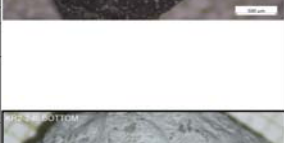



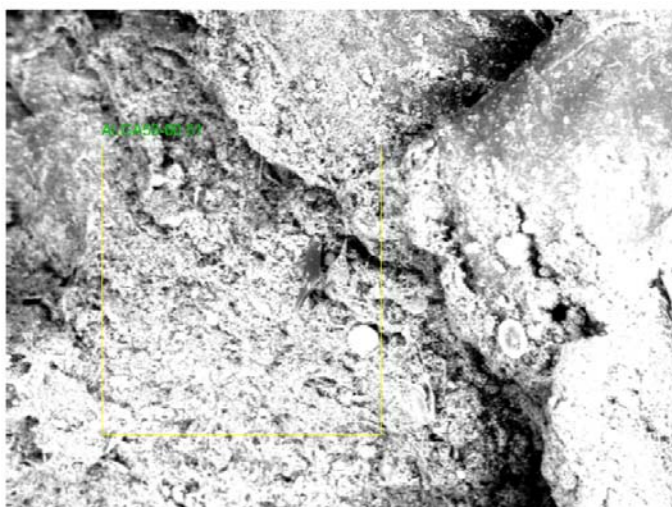
Unit	Depth (cm)	Sample	Description	Photo
E	0-25	(F) KR2_2 IV 0-1	Gypsum crystals, 2-3 mm, some small black grains, altered pyrite. Tiny iron hydroxides crusts	
		(E) KR2_2 IV 4-5	Aggregates of gypsum crystals in a microgranular gypsum matrix	
		(D) KR2_2 IV 9-10	Gypsum only	
		(C) KR2_2 IV 14-15	Gypsum in large crystals and "desert rose" aggregates. Some black grain, probably oxidized pyrite.	
		(B) KR2_2 IV 19-20	Gypsum only	
D	25-90	(A) KR2_2 IV 21-22	Gypsum only	
		(54) KR2_2 III 4-5	Only gypsum in large crystals and "desert rose" aggregates. Some black grain (oxidized pyrite).	
		(53) KR2_2 III 17-18	Gypsum only	
		(53) KR2_2 III 17-18	Gypsum only, some black grains	
		(52) KR2_2 III 20-21	Very scarce gypsum	
		(51) KR2_2 III 25-26	Gypsum, flat discoidal grains, small black grains	
		(50) KR2_2 III 30-31	Gypsum, flat discoidal grains, small black grains	
		(49) KR2_2 III 37-38	Gypsum, flat discoidal grains, small black grains	
		(48) KR2_2 III 43-43	Very scarce gypsum grains, very small black grains	
		(47) KR2_2 III 45-46	Gypsum, abundant micas (ms, bt)	
		(46) KR2_2 III 46-47	Gypsum, abundant micas (ms, bt)	
		(45) KR2_2 III 47-48	Forams, black grains (altered pyrite)	
		(44) KR2_2 III 48-49	Forams, black grains (altered pyrite)	
		(43) KR2_2 III 49-50	Forams, some flat gypsum crystals, red crusts of iron hydroxides	
		(42) KR2_2 III 50-51	Flat, laminated black/dark green grains. SEM: a mixture of clay minerals, silicates grains (quartz, ms), gypsum. Black color: carbon. Light-colored grains: a mixture of magnesite, Mg-calcite, clay minerals.	
		(41) KR2_2 III 51-52	Forams only	
		(40) KR2_2 III 52-53	Flat, laminated black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms), gypsum. Black color: carbon. Light-colored grains: Magnesite, Mg-calcite, clay minerals.	
		(39) KR2_2 III 53-54	Flat, laminated black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms), gypsum. Black color: carbon. Light-colored grains: Magnesite, Mg-calcite, clay minerals.	
		(38) KR2_2 III 54-55	Flat, laminated black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms), gypsum. Black color very probably indicate carbon. Light-colored grains: Magnesite, Mg-calcite, clay minerals.	
		(37) KR2_2 III 55-56	Flat, laminated black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms), gypsum. Black color: carbon. Light-colored grains: Magnesite, Mg-calcite, clay minerals.	
		(36) KR2_2 III 56-57	Gypsum, forams. Black plus light-colored grains, see 55-56	
		(35) KR2_2 III 57-58	Flat discoidal gypsum, black grains	
		(34BIS) KR2-2 III 59-60	Flat, laminated black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms). Black color: carbon.	
		(34) KR2_2 III 64-65	Rounded gypsum, abundant forams, some black grains	
		KR2_2 III 69-70B	Gypsum, flat, laminated black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms). Black color: carbon.	
C	9-235	KR2_2 III 69-70A	Gypsum, flat, laminated black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms). Black color: carbon.	
		KR2_2 III 74-74.5	Large black grains. SEM: a mixture of clay minerals plus silicate grains (quartz, ms). Black color: carbon.	
		(33) KR2_2 III 76-77	Similar to 81.5-82.5	
		(32) KR2_2 III 81.5-82.5	Large gypsum crystals, abundant forams, some black grains: a mixture of clay minerals, silicates.	
		KR2-2 III 85.5-86	One single large gypsum crystal, some black grains	
		(31) KR2_2 III 87.5-88.5	Two big gypsum crystal Light-colored grains: magnesite-Mg-calcite, clay minerals	
		KR2_2 III BOTTOM	Large (> 2 cm) light-colored grain: XRD identify a soft aggregate of magnesite, Mg-calcite, clay minerals (kaolinite). Some flat gypsum crystals.	
		(30) KR2_2 II 2-3	Scarce material, black grains of pyrite	
		(28) KR2_2 II 46-47	Only forams, very scarce mica	
		(26) KR2_2 II 52.5-53.5	Very scarce. Small black grains, probably carbon	
		(25) KR2_2 II 61-62	Mainly forams, abundant pyrite sometimes as fillings of foraminifera	
		(24) KR2_2 II 78-79	Mainly forams with yellow color. Irregular reddish-yellowish grains, iron hydroxides, pyrite, rare mica grains. Reddish grains are an aggregate of calcite + clay minerals.	
		(23) KR2_2 II 86-87	Mainly forams with yellow color. Irregular reddish-yellowish grains of iron hydroxides. Scarce mica	
		(22) KR2_2 I 3-4	Mainly forams with yellowish color (iron). Irregular reddish-yellowish grains, iron hydroxides	
		(21) KR2_2 I 12-13	Mainly forams with yellow color. Irregular reddish-yellowish grains, iron hydroxides	
		(20) KR2_2 I 19-20	Mainly forams, scarce biotite. Scarce pyrite sometimes as fillings of foraminifera	
		(19) KR2_2 I 23-24	Mainly forams, scarce biotite. Some pyrite sometimes as fillings of foraminifera	
B	235-245	(18) KR2_2 I 26-27 - 26579	Only forams	
		(17) KR2_2 I 20-31 - 26576	Forams, very scarce micas (ms + bt)	
		(16) KR2_2 I 35-36 - 26560	Forams, very scarce micas (ms + bt)	
		(15) C2-1 38-39 - 26559	Forams, very scarce micas (ms + bt)	
A	245-297	(14) KR2_2 I 42-43 - 26558	Forams, very scarce micas (ms + bt), scarce black grains (carbon)	
		(11) KR2_2 I 52-53 - 26555	Forams, black grains, oxydized pyrite	
		(9) KR2_2 I 61-62 - 26553	Forams, scarce terrigenous grains	
		(8) KR2_2 I 64-65 - 26552	Forams, gray grains, oxydized pyrite	
		(6) KR2_2 I 69-70 - 26550	Forams, abundant pyrite in crusts and framboid	
		(5) KR2_2 I 75-76 - 26549	Forams, scarce terrigenous grains	
		(3) KR2_2 I 84-85 - 26547	Forams, scarce pyrite	
		(1) KR2_2 I 89-90 - 25545	Forams, abundant pyrite in crusts and framboids	

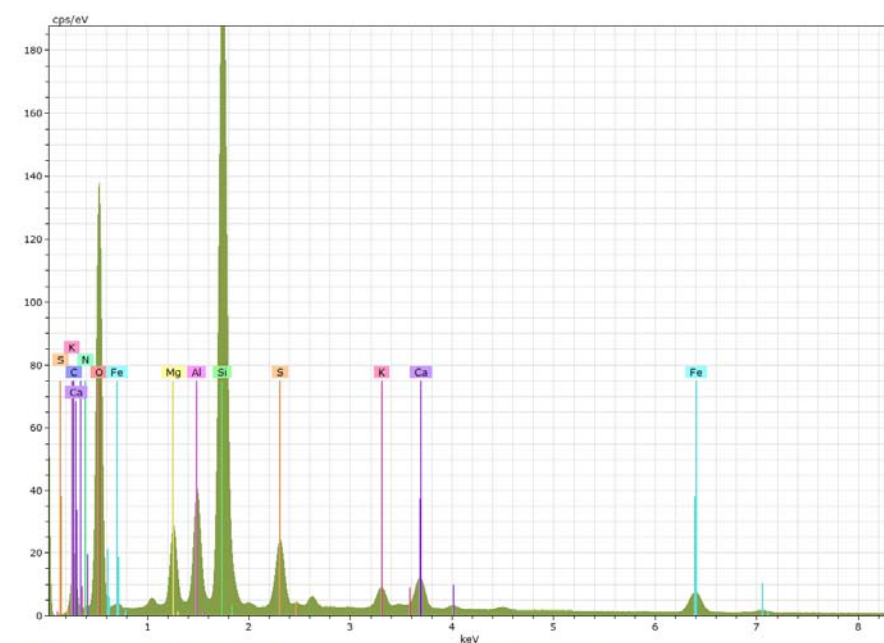
Table SM7_1 – mineralogical associations in the different sediment units

Report on mineralogical analyses on sediment samples

1) Sample 34bis (KR2_2 III 59-60)



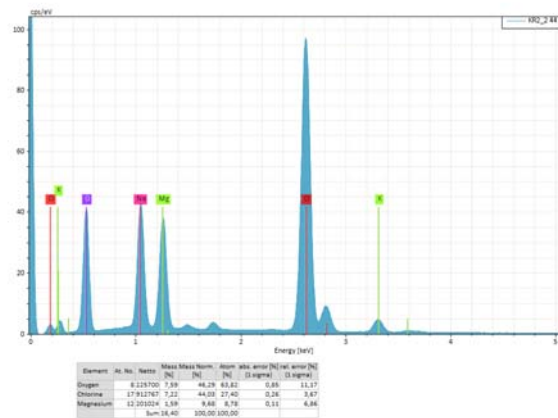
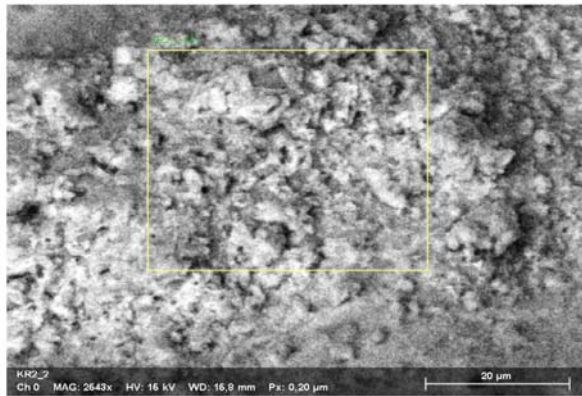
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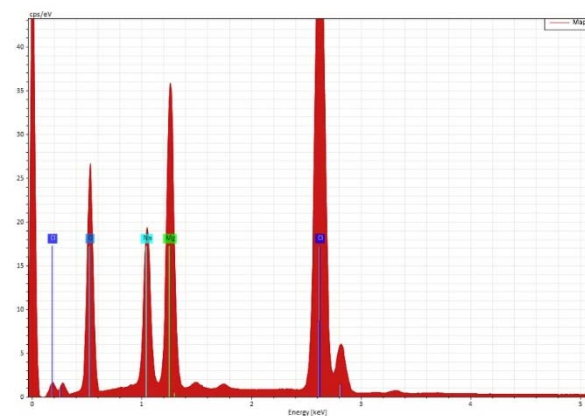
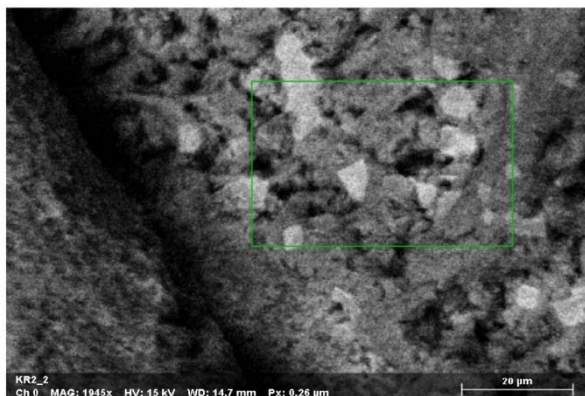
El	AN	Series	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Error (1 Sigma) [wt.%]
O	8	K-series	33.63	49.76	54.97	3.55
Si	14	K-series	11.93	17.65	11.11	0.53
C	6	K-series	10.94	16.18	23.81	1.27
Fe	26	K-series	2.39	3.54	1.12	0.09
Al	13	K-series	2.27	3.36	2.20	0.13
Mg	12	K-series	1.73	2.57	1.87	0.12
S	16	K-series	1.56	2.31	1.27	0.08
N	7	K-series	1.31	1.93	2.44	0.21
Ca	20	K-series	1.22	1.81	0.80	0.06
K	19	K-series	0.60	0.89	0.40	0.04
Total:			67.59	100.00	100.00	

Results: Quartz, clay minerals, pyrite, gypsum



09/10/2023

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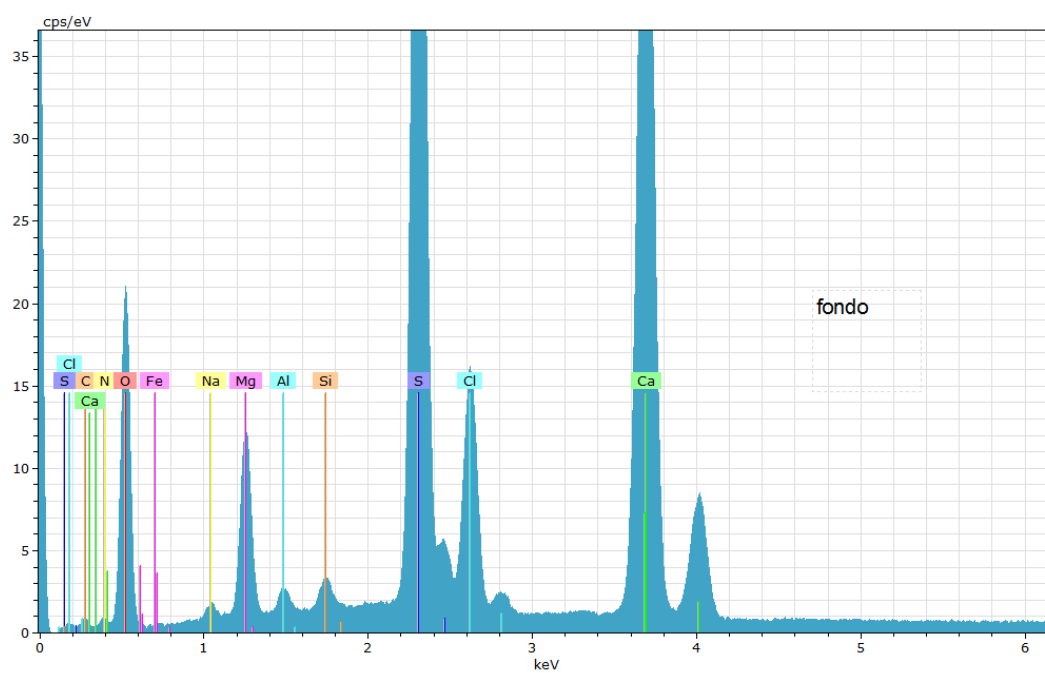
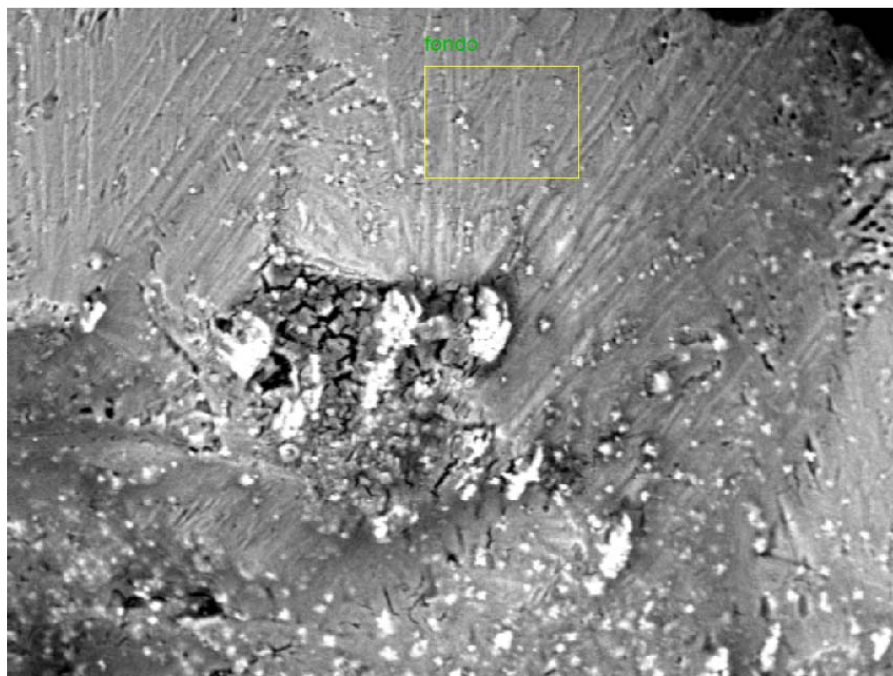
Element	At. No.	Line s.	Netto	Mass [%]	Mass Norm. [%]	Atom [%]	abs. error [%] (1 sigma)	abs. error [%] (2 sigma)	abs. error [%] (3 sigma)	rel. error [%] (1 sigma)	rel. error [%] (2 sigma)	rel. error [%] (3 sigma)
Oxygen		8 K-Serie	250773	6,64	43,42	60,37	0,74	1,48	2,23	11,18	22,35	33,53
Chlorine		17 K-Serie	1007564	6,45	42,20	26,48	0,24	0,48	0,72	3,71	7,42	11,13
Magnesium		12 K-Serie	354504	2,20	14,37	13,15	0,14	0,28	0,42	6,42	12,83	19,25
			Sum	15,29	100,00	100,00						

Element	At. No.	Line s.	Netto	Mass [%]	Mass Norm. [%]	Atom [%]	abs. error [%] (1 sigma)	abs. error [%] (2 sigma)	abs. error [%] (3 sigma)	rel. error [%] (1 sigma)	rel. error [%] (2 sigma)	rel. error [%] (3 sigma)
Chlorine		17 K-Serie	1008429	6,49	39,55	25,05	0,24	0,48	0,72	3,71	7,41	11,12
Oxygen		8 K-Serie	249381	6,40	39,02	54,76	0,72	1,43	2,15	11,19	22,38	33,58
Magnesium		12 K-Serie	359214	2,32	14,16	13,08	0,15	0,30	0,44	6,35	12,71	19,06
Sodium		11 K-Serie	146701	1,19	7,27	7,10	0,10	0,20	0,30	8,29	16,58	24,87
			Sum	16,40	100,00	100,00						

Results: bischofite ($\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$)

2) Sample 33_2 (KR2_2 III 69-70)

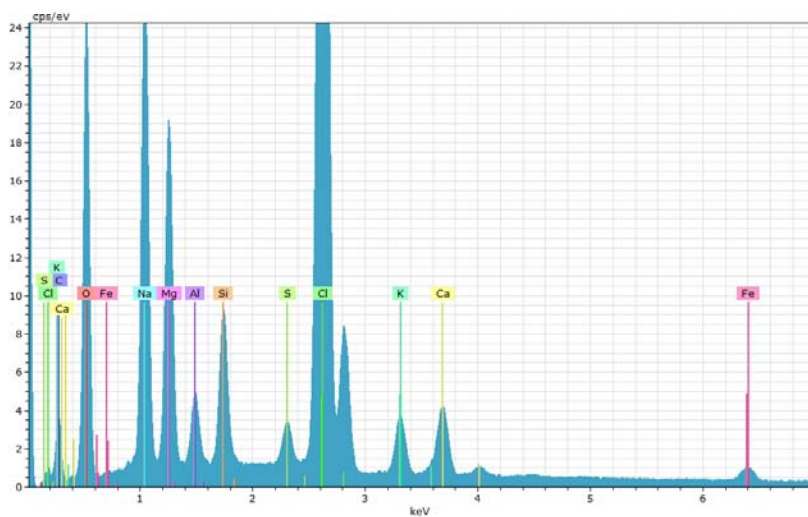
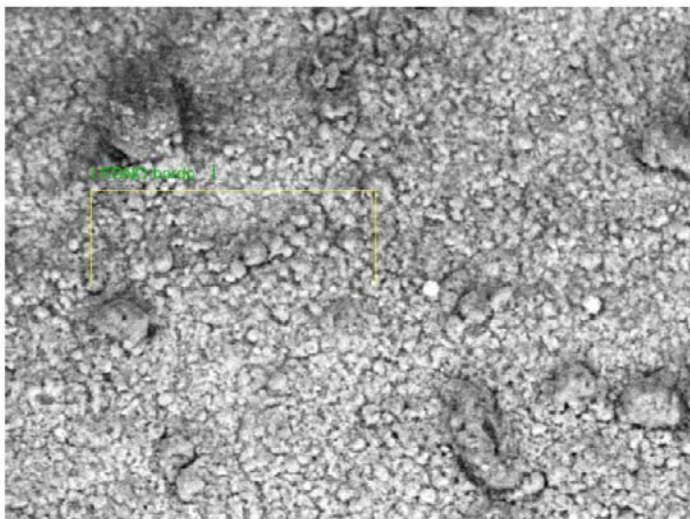
Application Note



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Results: Gypsum, bischofite, halite.



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Spectrum: LEGNO bordo . 1

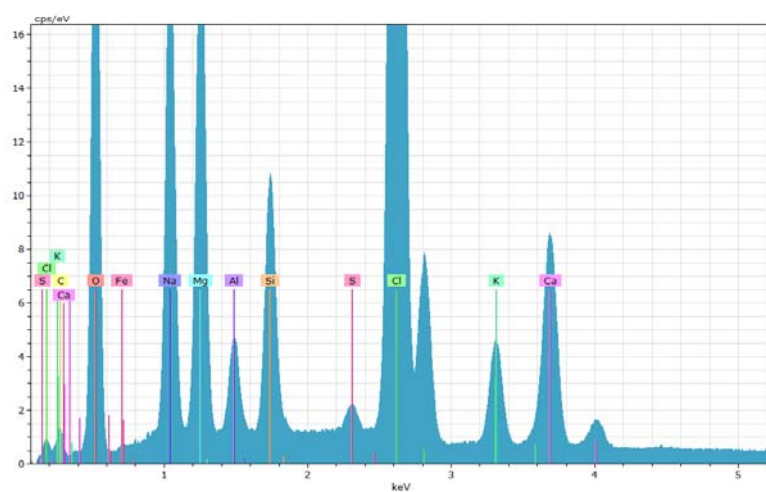
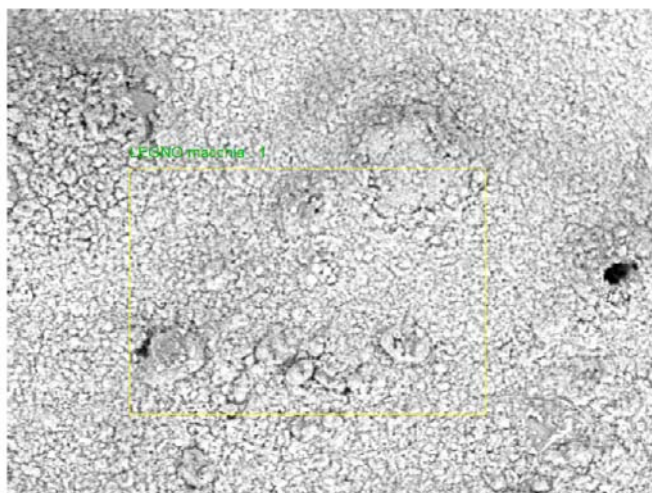
Element	Series	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Error (3 Sigma) [wt.%]
Oxygen	K-series	32.95	35.80	44.44	11.45
Chlorine	K-series	24.92	27.09	15.17	2.58
Carbon	K-series	12.60	13.69	22.63	5.51
Sodium	K-series	9.40	10.21	8.82	1.90
Magnesium	K-series	5.32	5.78	4.72	0.95
Calcium	K-series	1.79	1.94	0.96	0.24
Silicon	K-series	1.58	1.72	1.21	0.28
Potassium	K-series	1.19	1.29	0.65	0.19
Aluminium	K-series	0.89	0.97	0.71	0.21
Iron	K-series	0.92	1.00	0.35	0.16
Sulfur	K-series	0.47	0.51	0.32	0.13
Total:		92.02	100.00	100.00	

Application Note

Spectrum: LEGNO bordo . 2

Element	Series	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Error (3 Sigma) [wt.%]
Oxygen	K-series	29.30	34.37	46.36	9.75
Chlorine	K-series	27.32	32.04	19.50	2.82
Sodium	K-series	11.72	13.75	12.91	2.34
Carbon	K-series	5.23	6.13	11.02	2.36
Magnesium	K-series	5.28	6.19	5.50	0.94
Silicon	K-series	1.80	2.11	1.62	0.31
Calcium	K-series	1.64	1.92	1.04	0.22
Potassium	K-series	1.14	1.34	0.74	0.18
Aluminium	K-series	1.00	1.17	0.94	0.22
Iron	K-series	0.83	0.98	0.38	0.15
Total:		85.26	100.00	100.00	

Results: Halite, silicates, gypsum, magnesium carbonate.

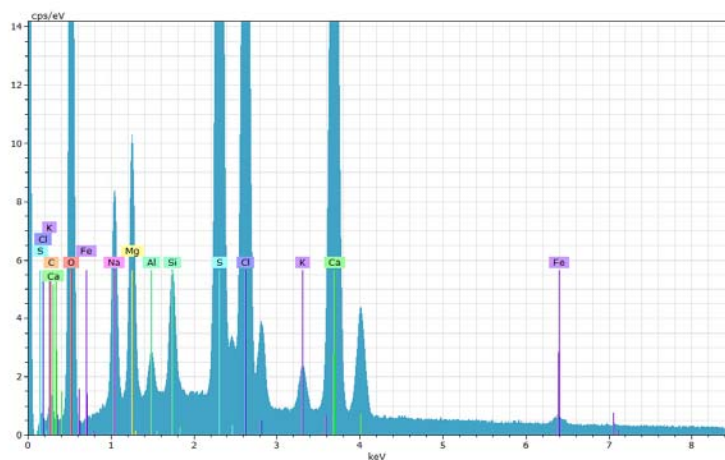
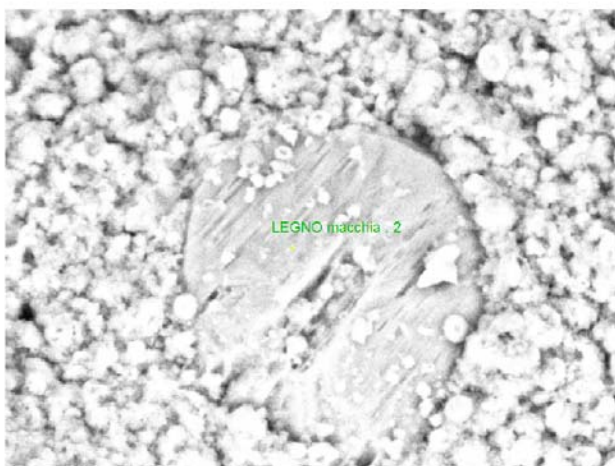


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Spectrum: LEGNO macchia . 1

El	AN	Series	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Error (1 Sigma) [wt.%]
O	8	K-series	33.85	40.84	54.75	3.82
Cl	17	K-series	23.01	27.77	16.80	0.80
Na	11	K-series	7.35	8.87	8.28	0.50
Mg	12	K-series	5.88	7.09	6.26	0.35
Ca	20	K-series	4.17	5.03	2.69	0.15
C	6	K-series	3.27	3.95	7.05	0.59
Si	14	K-series	1.96	2.37	1.81	0.11
K	19	K-series	1.56	1.89	1.03	0.07
Al	13	K-series	0.87	1.05	0.84	0.07
Fe	26	K-series	0.79	0.95	0.36	0.05
S	16	K-series	0.16	0.19	0.13	0.03
Total:			82.87	100.00	100.00	



Spectrum: LEGNO macchia . 2

El	AN	Series	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Error (1 Sigma) [wt.%]
O	8	K-series	51.84	48.34	64.08	5.93
Ca	20	K-series	18.53	17.28	9.14	0.57
Cl	17	K-series	12.46	11.62	6.95	0.44
S	16	K-series	11.43	10.66	7.05	0.43
Na	11	K-series	3.91	3.65	3.36	0.28
Mg	12	K-series	3.30	3.08	2.69	0.21
C	6	K-series	3.11	2.90	5.12	0.61
Si	14	K-series	1.05	0.97	0.74	0.07
K	19	K-series	0.76	0.71	0.38	0.05
Al	13	K-series	0.46	0.43	0.34	0.05
Fe	26	K-series	0.41	0.38	0.14	0.04
Total:			107.25	100.00	100.00	

Results: halite, silicates, gypsum, magnesium carbonate.