

Multi-Analytical Analysis of Decorative Color Plasters from the Thracian Tomb near Alexandrovo, Bulgaria

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Table S1. The spectral lines used for element detection in the LIBS analysis.

Elements ^a	Wavelength of spectral lines (nm)
Ca (I)	422.67, 428.30, 428.94, 429.9, 430.77, 431.86, 442.54, 445.48, 558.88, 714.81
Ca (II)	315.89, 370.60, 373.69, 393.37, 396.85, 645.69
Si (I)	288.16, 390.55, 569.04
Mg (I)	285.21, 516.73, 517.27, 518.36
Mg (II)	592.34
Fe (I)	302.06, 344.06, 358.12, 360.88, 361.87, 374.56, 374.95, 375.82, 438.35, 440.47
Al (I)	309.27, 394.40, 396.15
K (I)	766.49, 769.90
Na (I)	589.00, 589.59
Sr (I)	460.73, 483.21
Mn (I)	403.45, 403.31, 403.08

^aThe Roman numerals I and II denote spectral lines emitted from neutral atoms and singly ionized atoms, respectively.

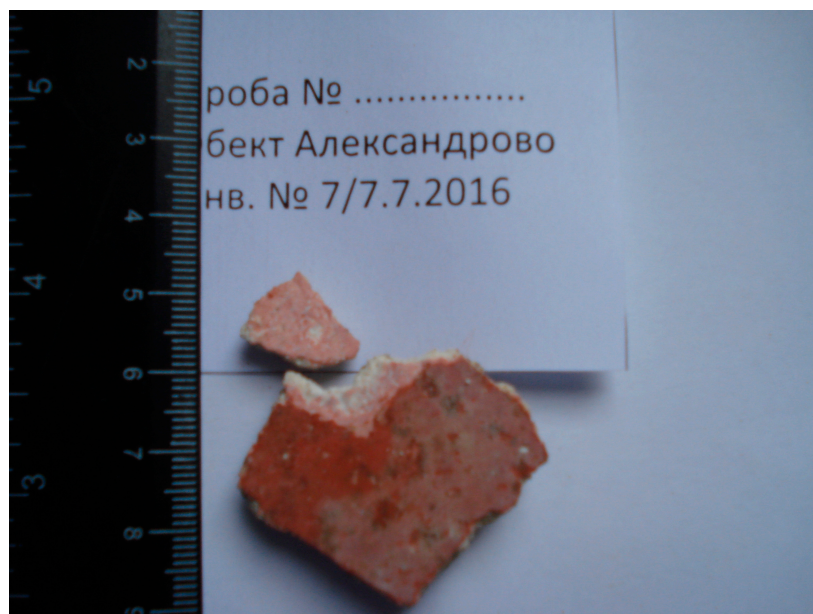


Figure S1. Red colored fragment from the dromos.



Figure S2. White colored fragment from the dromos.

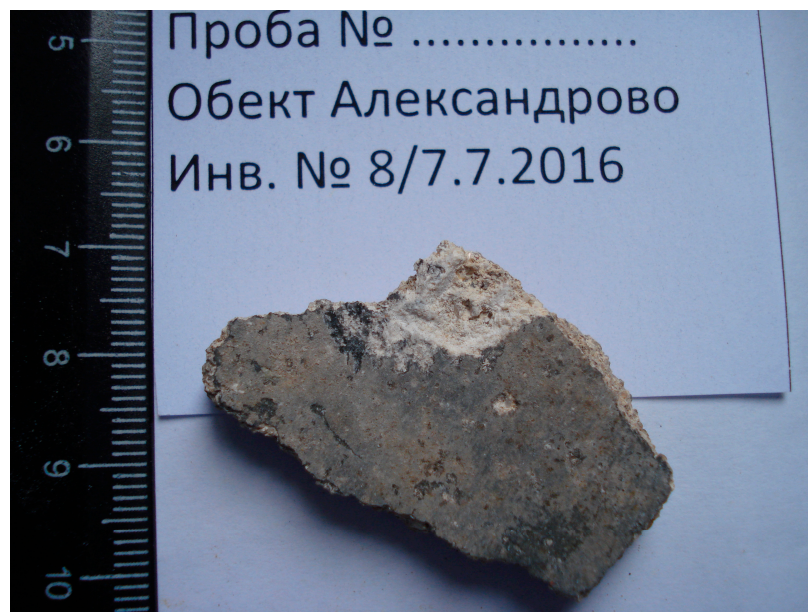


Figure S3. Black colored fragment from the dromos.

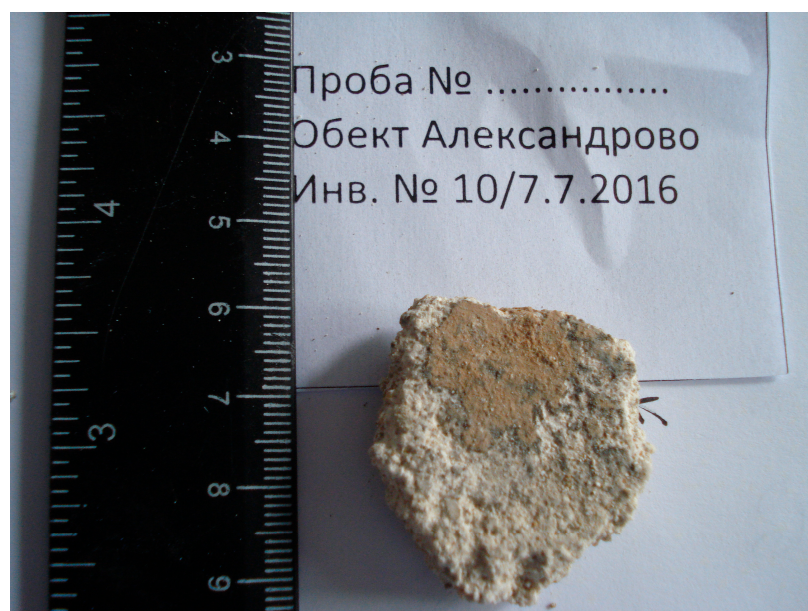


Figure S4. Brown colored fragment from the dromos.

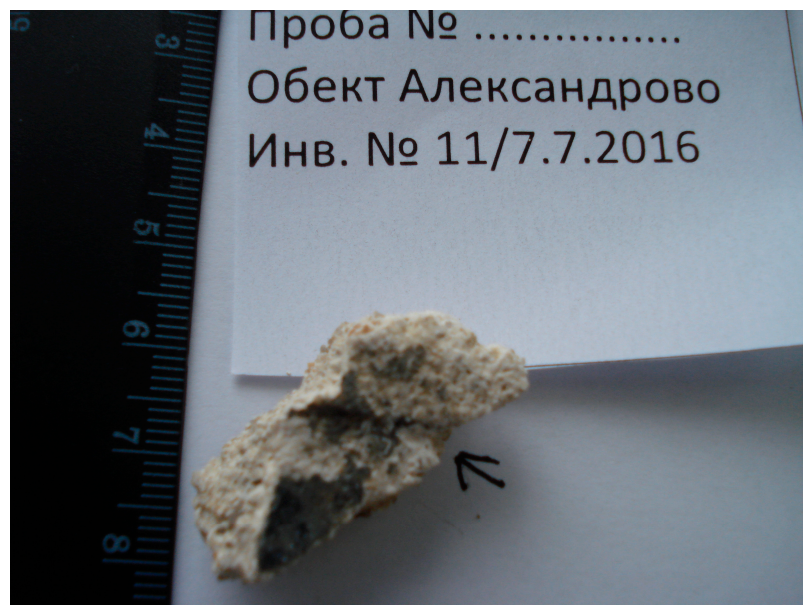


Figure S5. Grey colored fragment from the dromos.



Figure S6. Red colored fragment from the chamber.



Figure S7. White colored fragment from the chamber.

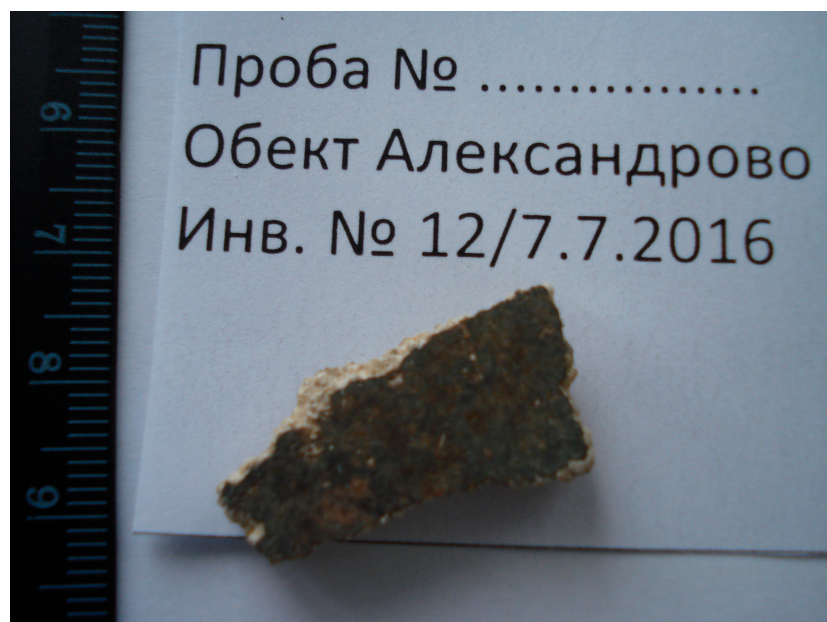


Figure S8. Black colored fragment from the chamber.

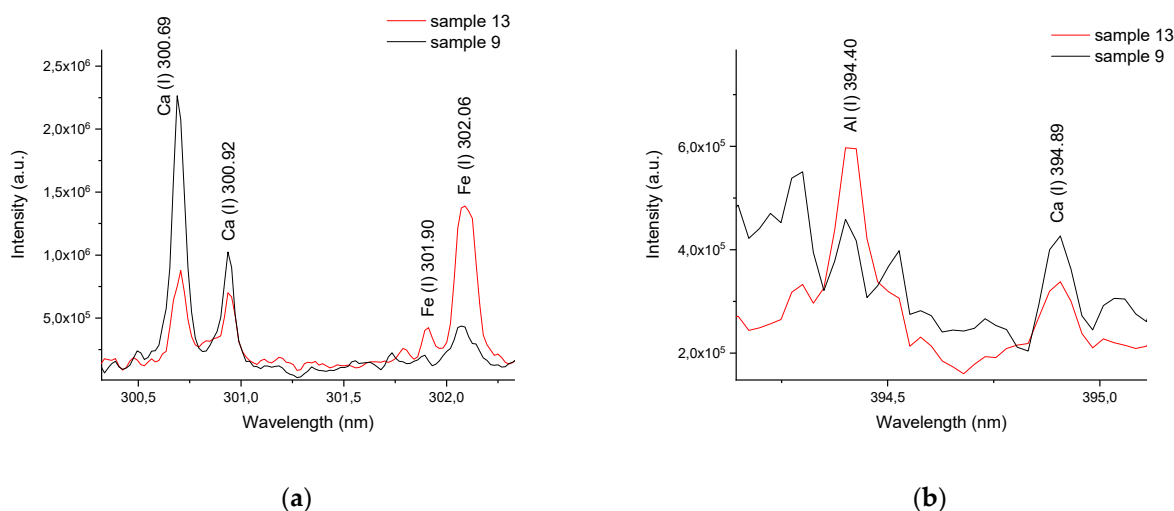


Figure S9. Two sections of LIBS spectra in the spectral region **(a)** 300 nm to 303 nm and **(b)** 394 nm to 395 nm obtained from fragments 13 (red, chamber) and 9 (white, dromos) calcium, iron and aluminum spectral lines labeled.

Table S2. EPR parameters of reference black pigments and ashed materials.

Reference Black Pigment Materials	g-factor	ΔH_{pp} [mT]
Furnace Black	2.00261	0.35
Ivory Black (Maimar)	2.00294	0.30
Ivory Black (Kremer)	2.00289	0.25
Beech (Bister genuine)	2.00297	0.35
Literature data		
cremated bones	2.0030[2]	0.2
bituminous coals	2.0027 - 2.0038[3]	0.61 – 0.80
Beech wood	2.0034 - 2.0031[4]	0.29 – 0.50

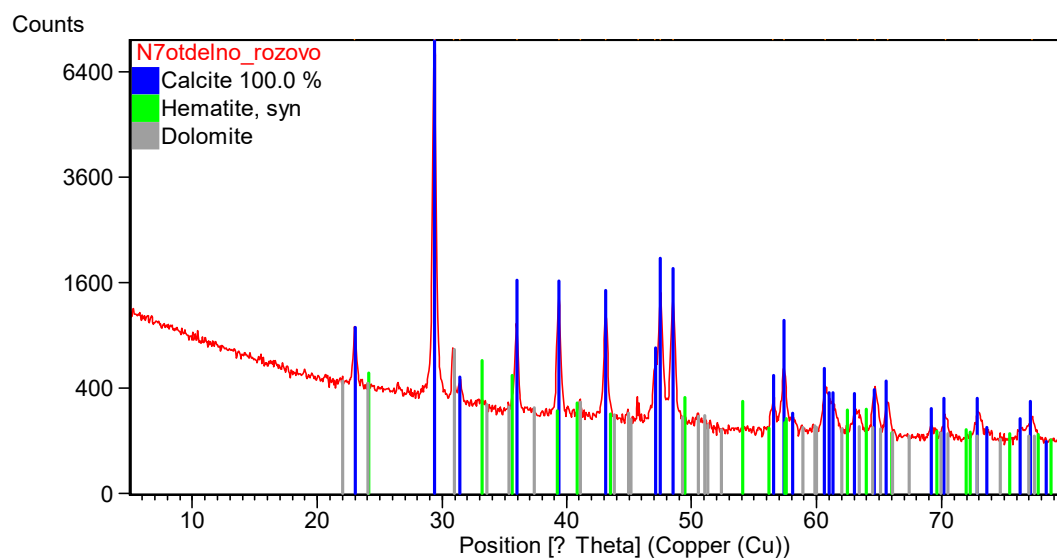


Figure S10. Diffraction pattern of red colored fragment from dromos.

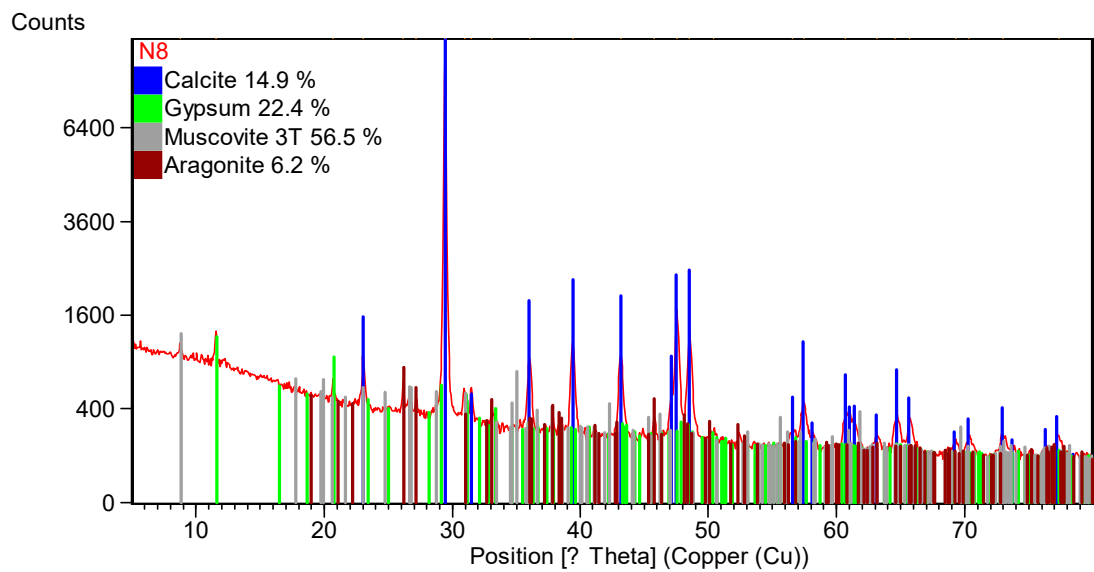


Figure S11. Diffraction pattern of black colored fragment from dromos.

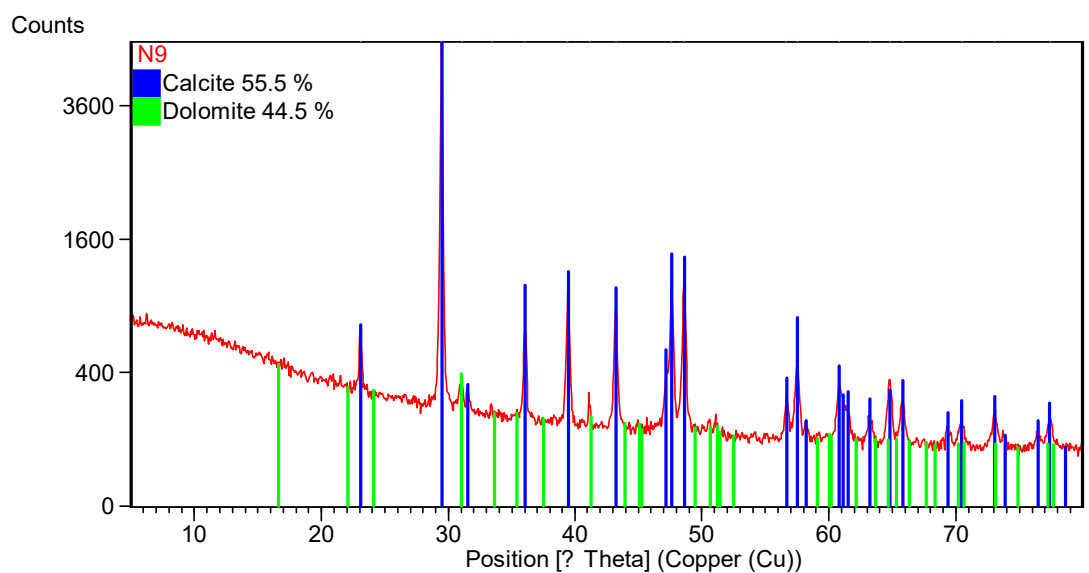


Figure S12. Diffraction pattern of white colored fragment from dromos.

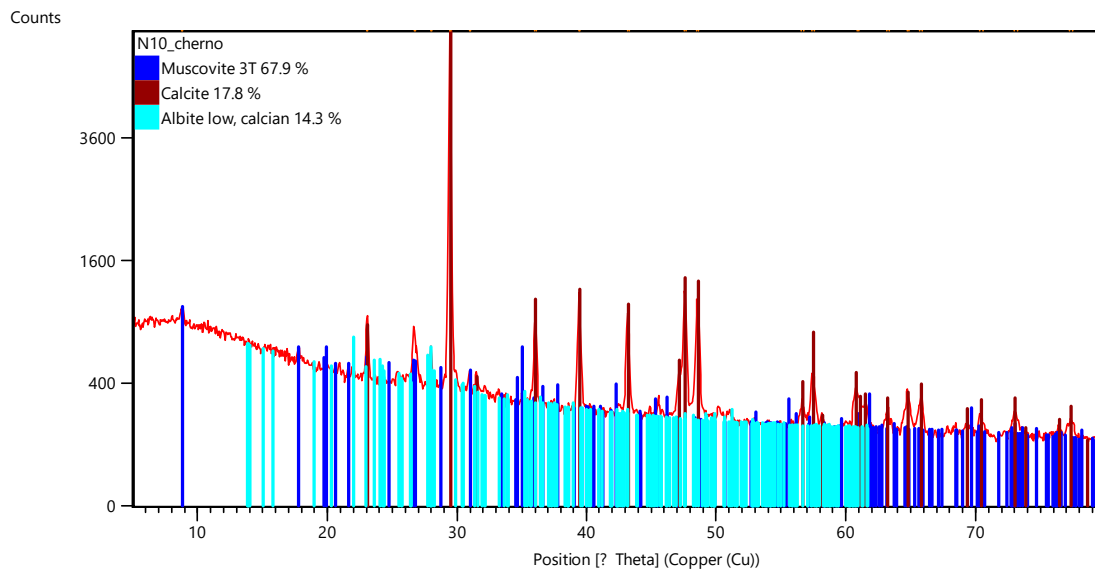


Figure S13. Diffraction pattern of brown colored fragment from dromos.

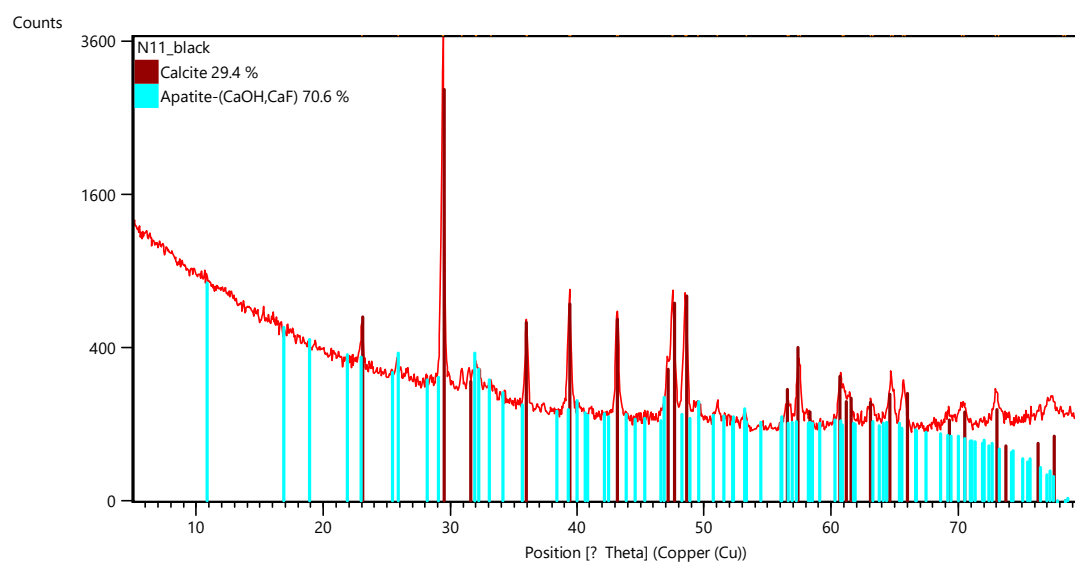


Figure S14. Diffraction pattern of grey colored fragment from dromos.

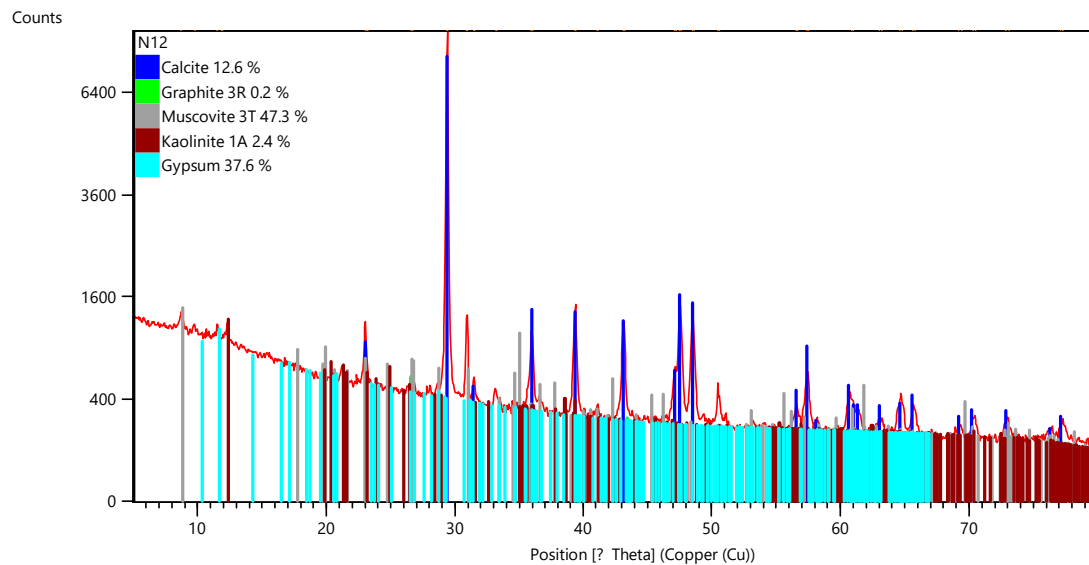


Figure S15. Diffraction pattern of black colored fragment from chamber.

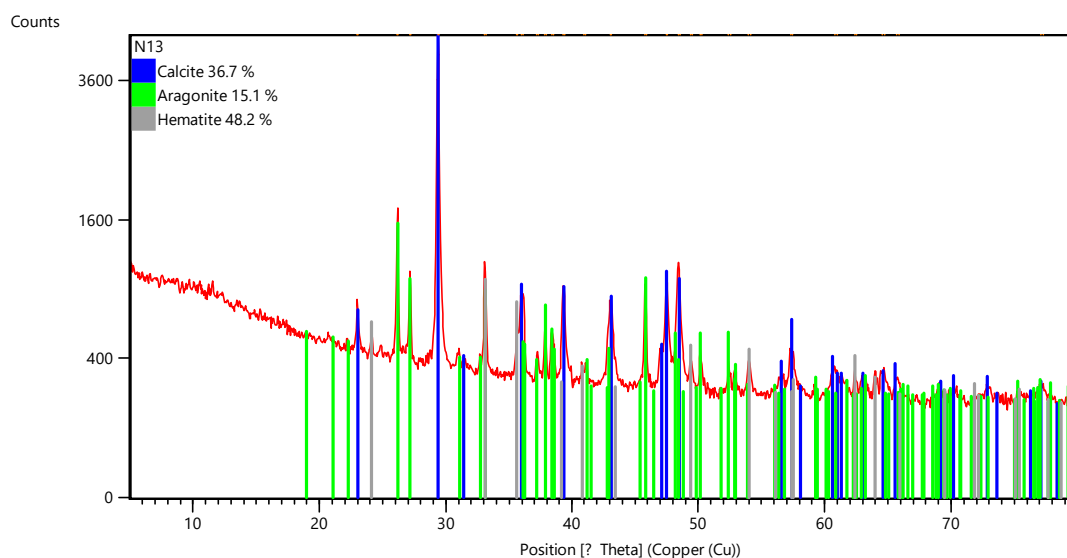


Figure S16. Diffraction pattern of red colored fragment from chamber.

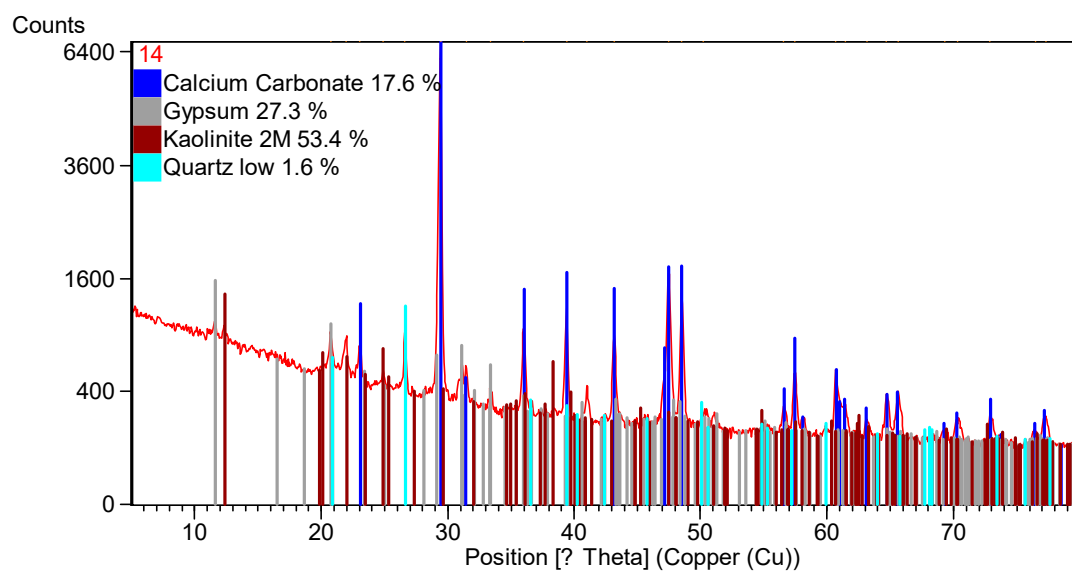


Figure S17. Diffraction pattern of black colored fragment from chamber.

Table S3. Identified components and IR characteristic bands of the studied samples, measured by ATR-FTIR technique.

Sample	Identified Components	IR Characteristic (cm ⁻¹)
White, dromos	Calcite	2521, 1432, 875, 713
White, chamber	Calcite	2521, 1432, 875, 713
	Kaolinite	3694, 3625, 1109, 1034, 1008, 914
Black, dromos	Calcite	1400, 871, 712
Black, chamber	Calcite	1408, 871, 712
	Kaolinite	3697, 3621, 1033, 1012, 920, 796, 777
Red, dromos	Calcite	2516, 1407, 872, 847, 712
	Red ochre	3693, 3620, 1099, 1035, 1012, 915, 796
Red, chamber	Calcite	2514, 1406, 871, 712
	Red ochre	3696, 3620, 1083, 1035, 915, 797
Grey, dromos	Calcite	2512, 1405, 875, 847, 712
	Hydroxyapatite	1029
Brown, dromos	Calcite	2512, 1412, 872, 848, 712
	Aluminosilicate	3697, 3624, 1088, 1029, 1008

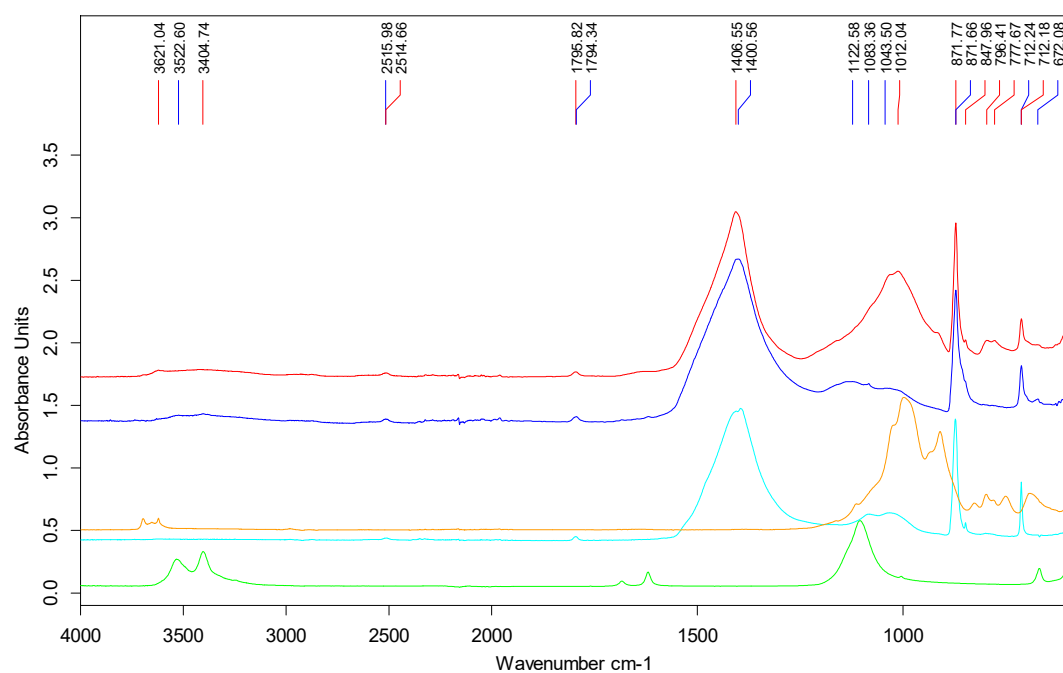


Figure S18. ATR-FTIR spectra of the black colored surface layers from dromos (in blue) and chamber (in red); and reference materials calcite (in light blue), gypsum (in green) and kaolinite (in orange).

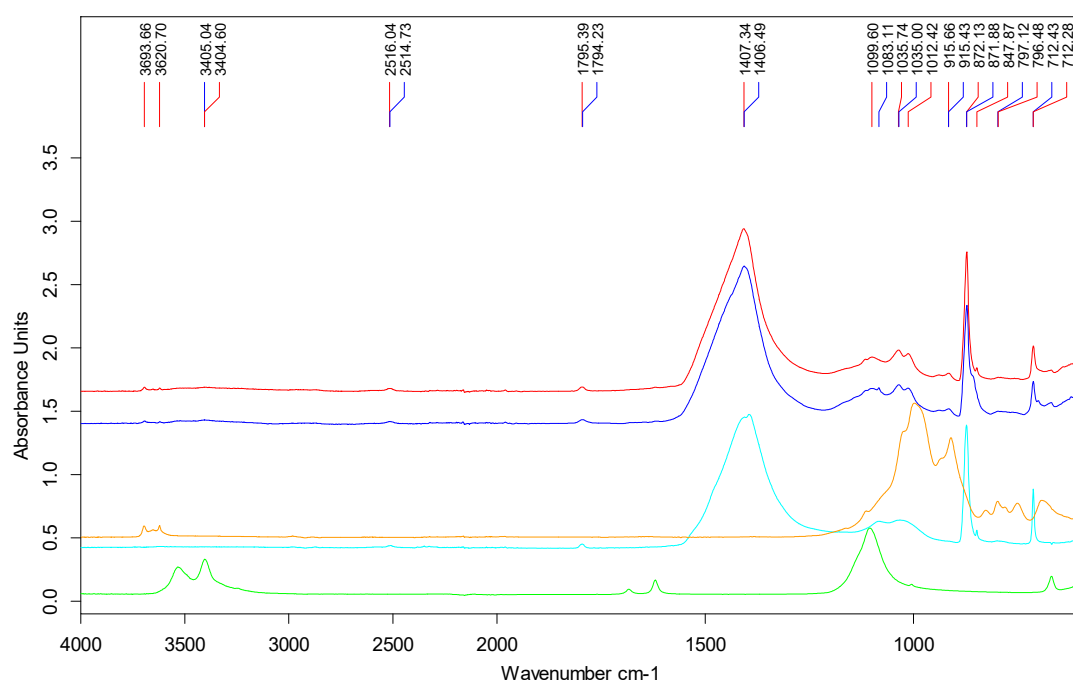


Figure S19. ATR-FTIR spectra of the red colored surface layers from dromos (in red) and chamber (in blue); and reference calcite (in light blue), gypsum (in green) and kaolinite (in orange).

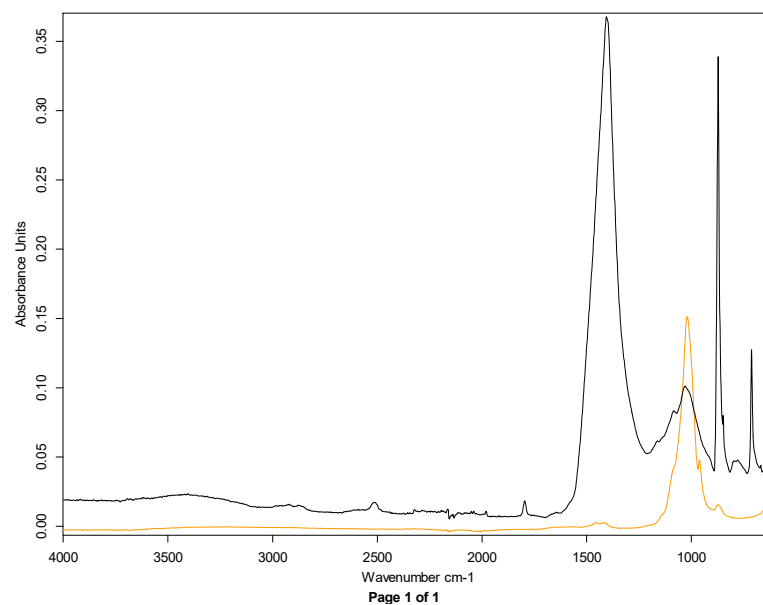


Figure S20. ATR-FTIR spectra of the dark grey colored surface layer from dromos (in black) and reference material hydroxyapatite (Ruff R050512, in orange).