coatings

Supplementary Materials: TEOS-Based Superhydrophobic Coating for the Protection of Stone-Built Cultural Heritage

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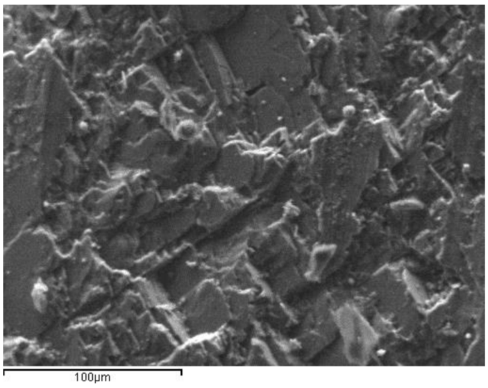
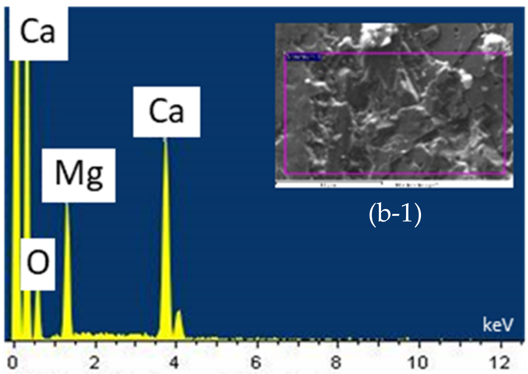
1. SEM-EDS and XRD Characterization of Marble

Marble specimens were studied using SEM-EDS and XRD. Indicative results are provided in Figures S1 and S2, respectively. The SEM-EDX results reveal the significant concentration of calcium and magnesium. This result is in agreement with the dolomitic character of Thassos marble. Furthermore, the prominent peak at 30.99° in the XRD spectrum of Figure S2 occurs in dolomite samples [1]. Other peaks detected in the XRD spectrum which support the dolomitic character of the sample are recorded at 41.25°, 50.65° and 51.12° [2].



(**a**)



(**b**)

Figure S1. (**a**) SEM image of bare, uncoated piece of Thassos marble. (**b**) SEM-EDS analysis of uncoated marble. (**b-1**) The scan area is designated by the box in the image.

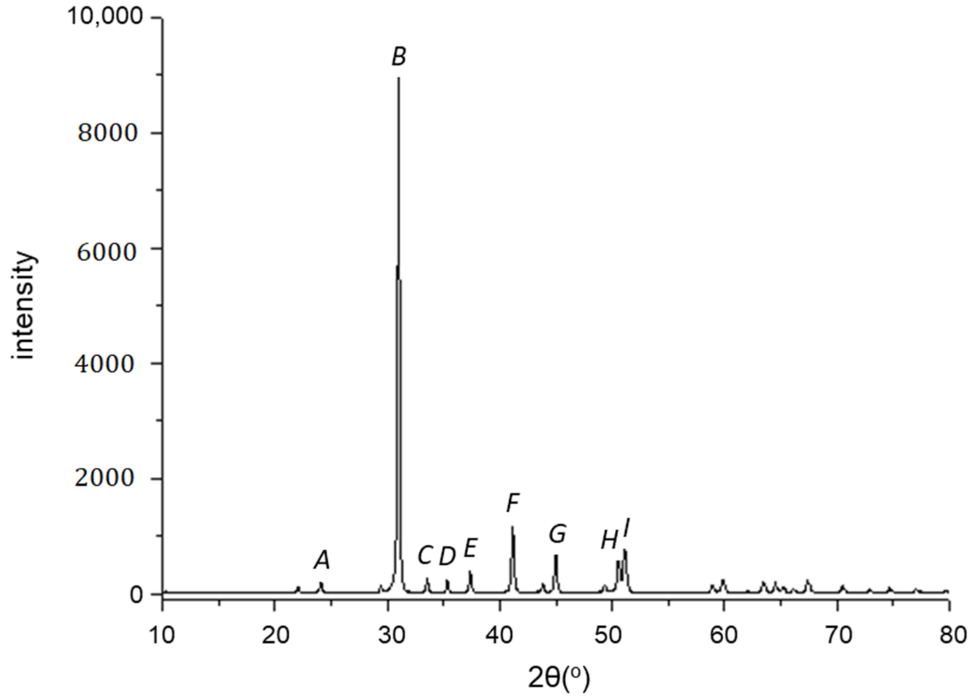
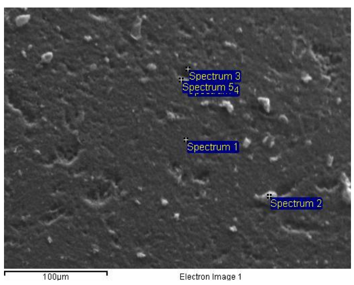


Figure S2. XRD analysis of uncoated marble. The major peaks are *A* = 24.01°, = 30.99°, *C* = 33.64°, *D* = 35.46°, *E* = 37.38°, *F* = 41.25°, *G* = 44.97°, *H* = 50.65°, *I* = 51.12°, *J* = 59.92°.

2. SEM-EDS Characterization of Coated Marble

The surfaces of coated marble samples were investigated using SEM-EDS. An example from this study is provided in Figure S3. To produce the sample of Figure S3, the TEOS-FAS sol was sprayed onto marble. Elevated concentrations of silicon (Si) and fluorine (F) were recorded suggesting a uniform coverage of marble by the TEOS-FAS coating. Other elements recorded at elevated concentrations were calcium (Ca), magnesium (Mg) and oxygen (O) and were originated from the marble substrate, as revealed in Figure S1.



Spectrum *	O	F	Mg	Si	Ca	Total
1	44.09	17.83	12.96	12.90	12.22	100
2	35.79	29.07	2.50	30.07	2.57	100
3	32.92	14.95	7.11	22.84	22.18	100
4	46.98	16.66	12.03	13.86	10.47	100
5	42.72	17.00	13.46	14.46	12.35	100

* Carbon (C) is excluded from the given results.

Figure S3. Indicative SEM-EDS results for coated marble. The wt.% percentages are shown in the table. In this case the coating was applied by spraying.

References

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