

Supplementary Information

Nature-inspired protective coating on soft/wet biomaterials for SEM by aerobic oxidation of polyphenols

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Supplementary Videos

Supplementary Videos S1, S2, and S3 are available on the website.

Supplementary Figures

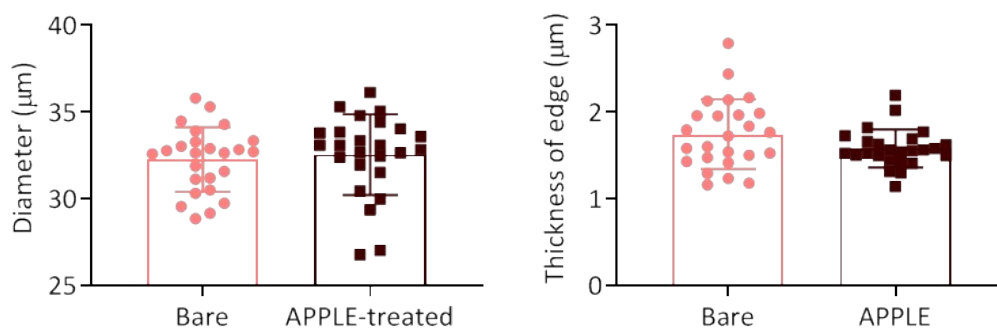


Fig. S1 Quantitative analysis of the size of microbeads shown in Fig. 2b before and after APPLE treatment (left, $n=25$, $p=0.6335$) and the thickness of edge before and after spin coating on wet tissue shown in Fig. 2c (right, $n=25$, $p=0.0811$).

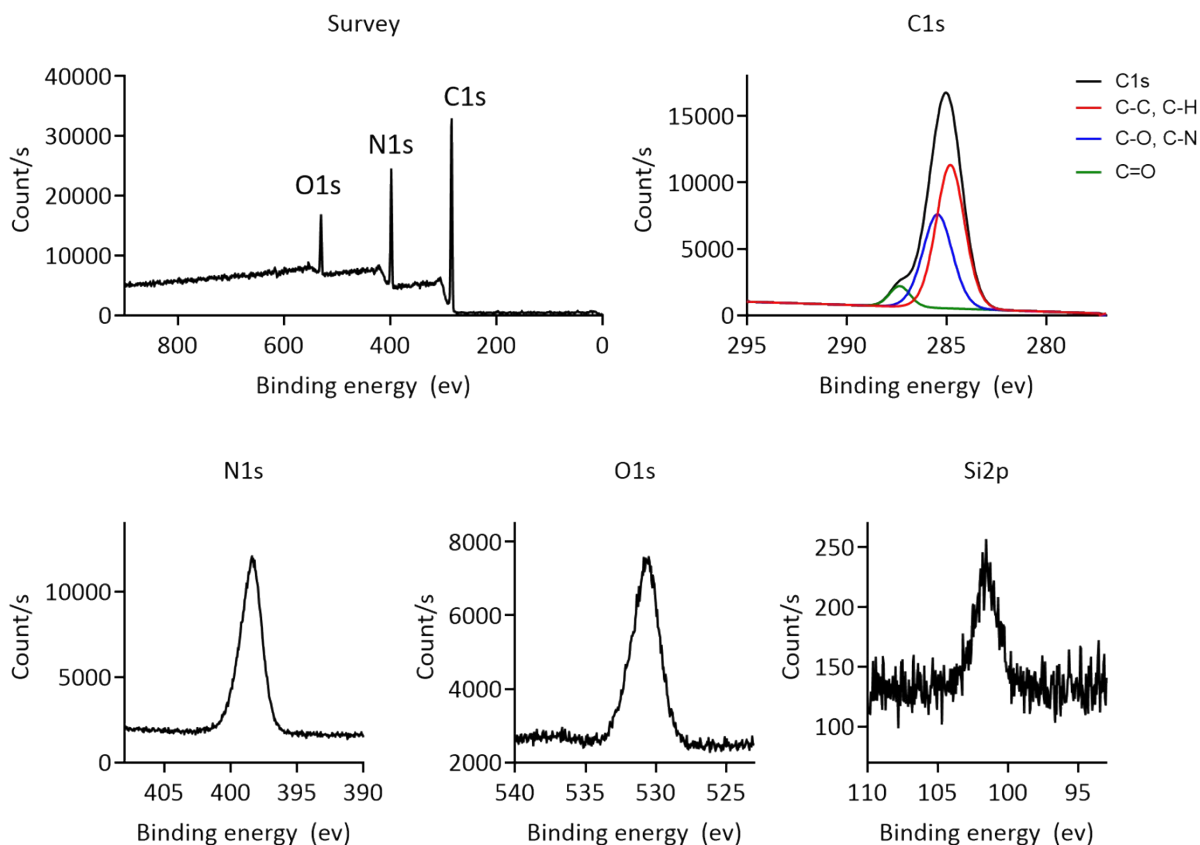


Fig. S2 XPS analysis of APPLE on silicon wafer. Survey scan indicates the co-existence of nitrogen from PEI and oxygen from PG. Si2p peak confirms that the coating is similar or slightly thinner than 10-15 nm, the depth limitation in XPS analysis.

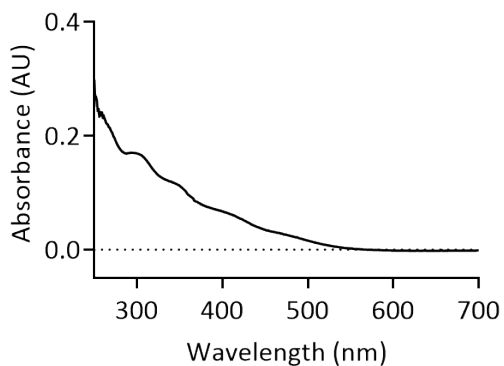


Fig. S3 UV-vis absorbance of APPLE on glass substrate. Broad-range absorbance from UV to visible range is the characteristic of oxidized followed oligomerized/polymerized PG with PEI

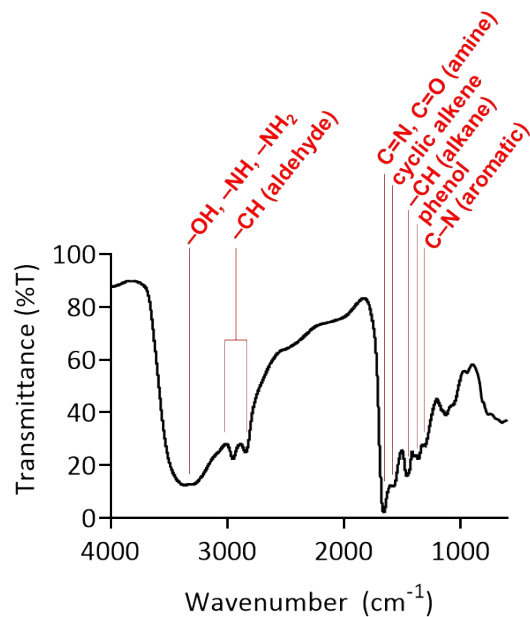


Fig. S4 Infrared spectroscopic analysis of the bulk APPLE film. Peaks from PEI and PG were assigned.

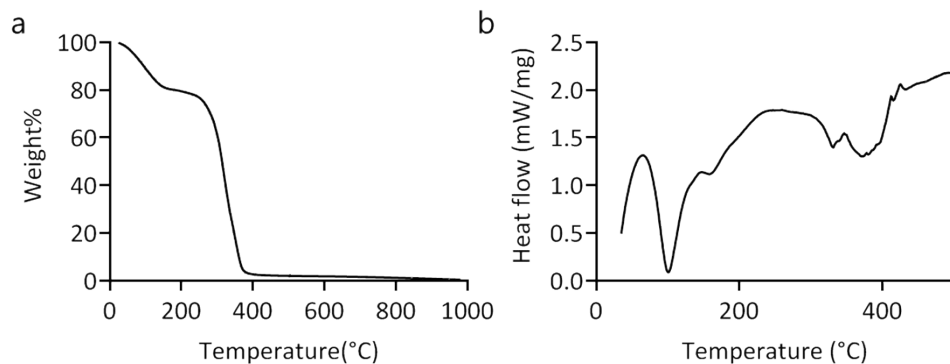


Fig. S5 Thermal analysis of bulk APPLE. (a) Thermal gravimetric analysis (TGA) data and (b) differential scanning calorimetry (DSC) data showing complete decomposition at about 300-400 °C.

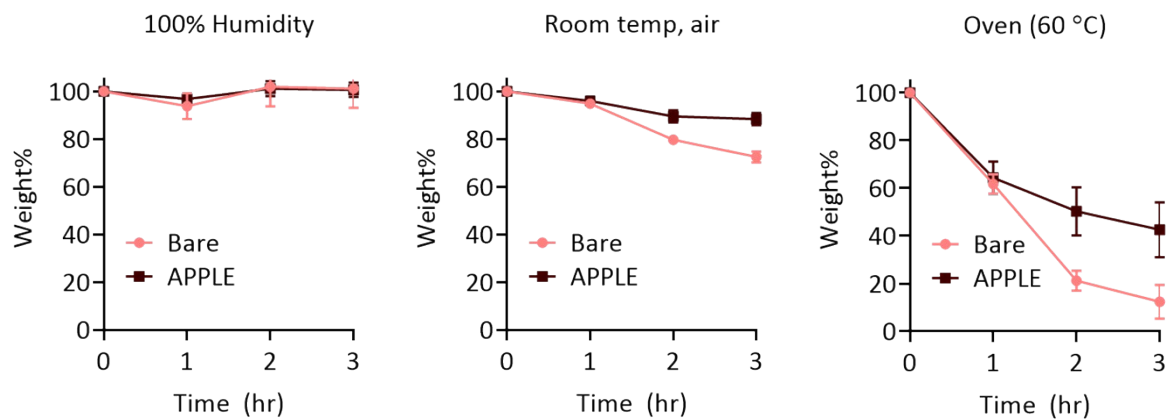


Fig. S6 Dehydration protection capability of APPLE in various environments. Remaining weight% of APPLE-coated and bare 1% agarose gel incubated under 100% humidity, in the air at room temperature, in 60 °C oven were monitored up to three hours (n=5).