SUPPORTING INFORMATION

Stearate coated biogenic calcium carbonate from waste seashells: A sustainable plastic filler

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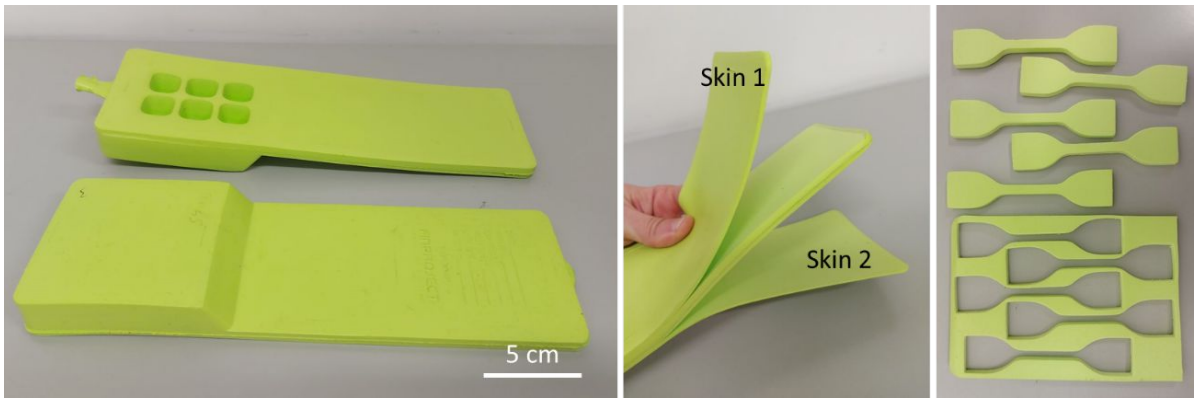

Figure S1. Polymeric compound specimen preparation for mechanical and aesthetic evaluations.

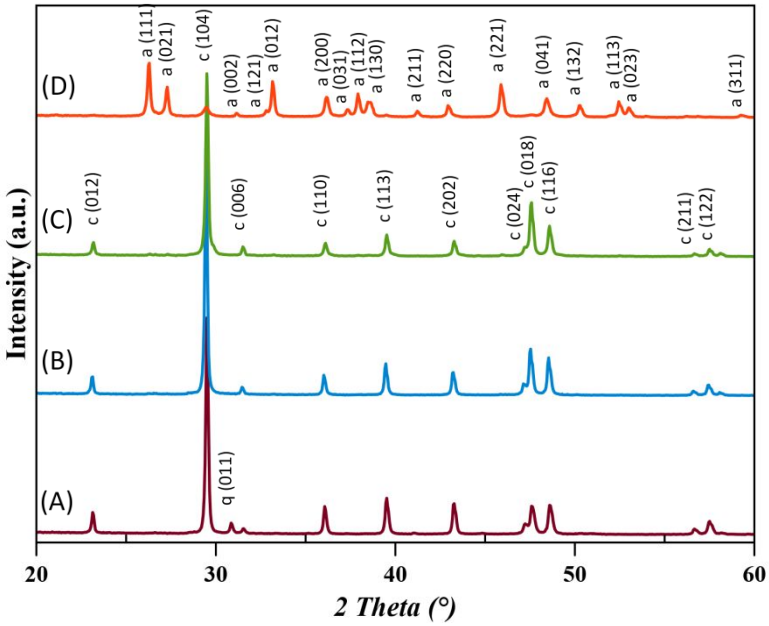

Figure S2. X-ray powder diffraction patterns of geogenic $CaCO_3$ (A), oyster shell (B), scallop shell (C) and clam shell powder (D). The diffraction patterns were indexed accordingly to the PDF 00-005-0586 for calcite (c), PDF 00-005-0453 for aragonite (a) and PDF 01-080-2148 for quartz (q).

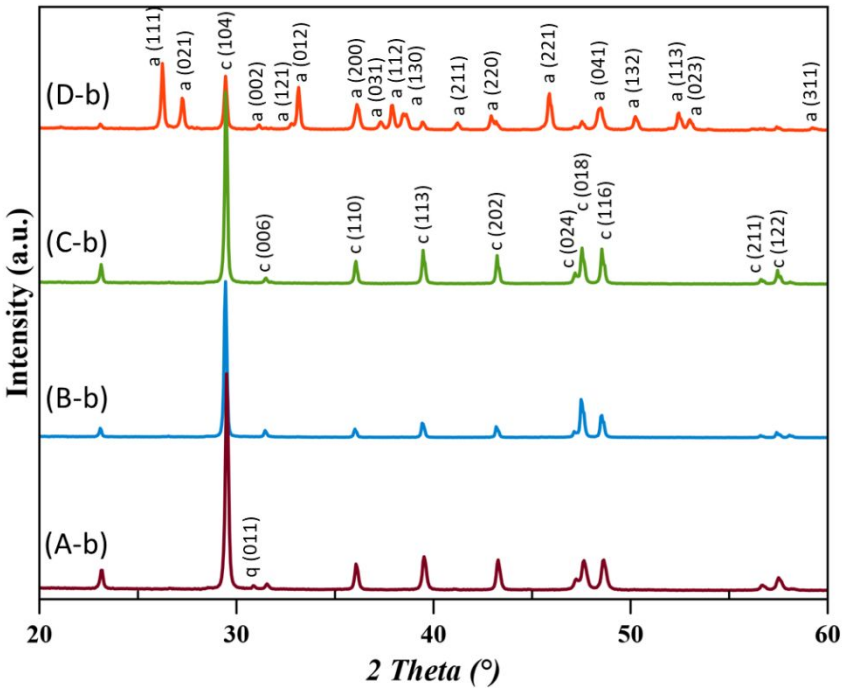

Figure S3. X-ray powder diffraction patterns of bleached geogenic $CaCO_3$ (A-b), oyster shell (B-b), scallop shell (C-b) and clam shell powder (D-b). The diffraction patterns were indexed accordingly to the PDF 00-005-0586 for calcite (c), PDF 00-005-0453 for aragonite (a) and PDF 01-080-2148 for quartz (q).

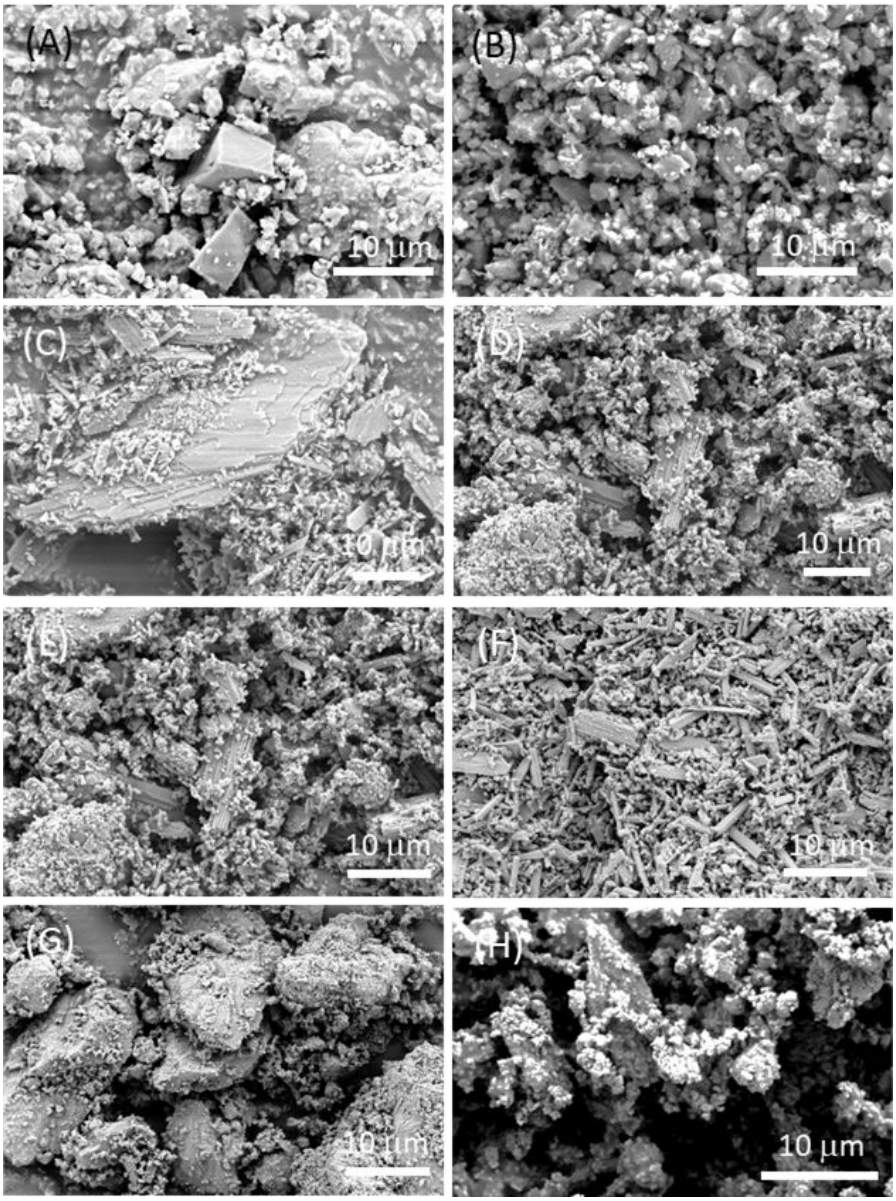

Figure S4. Low magnification SEM images of unbleached (A, C, E and G) and bleached (B, D, F and H) powders from geogenic calcite (A, B), oyster shells (C, D), scallop shells (E, F) and clam shells (G, H). These images are representative of the entire population of particles.

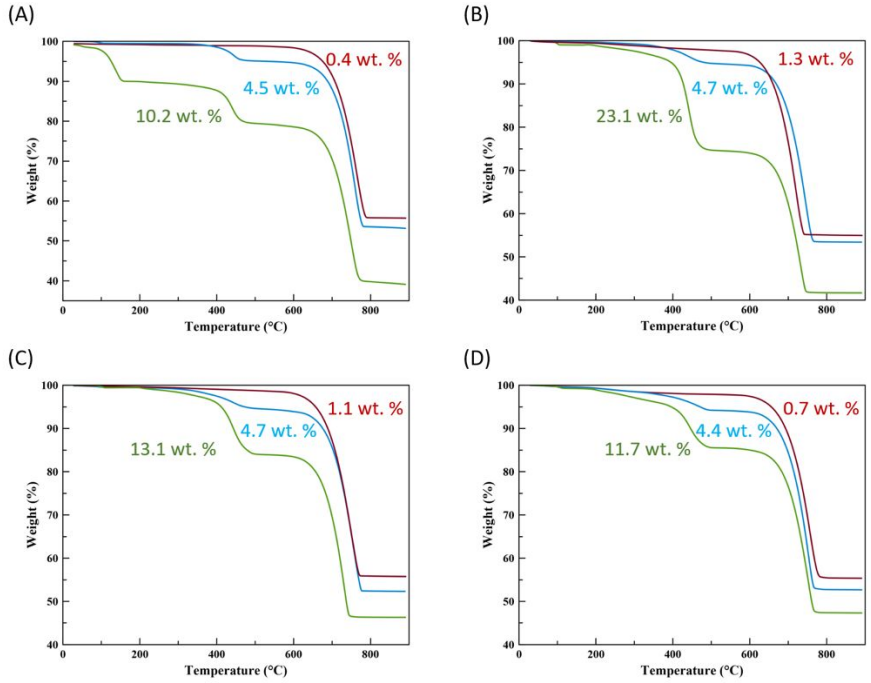

Figure S5. TGA profiles of powder of geogenic $CaCO_3$ (A), oyster shells (B), scallop shells (C) and clam shells (D) (red) and corresponding coated powder with 40 mM (blue) and 400 mM aqueous sodium stearate (green) solutions.

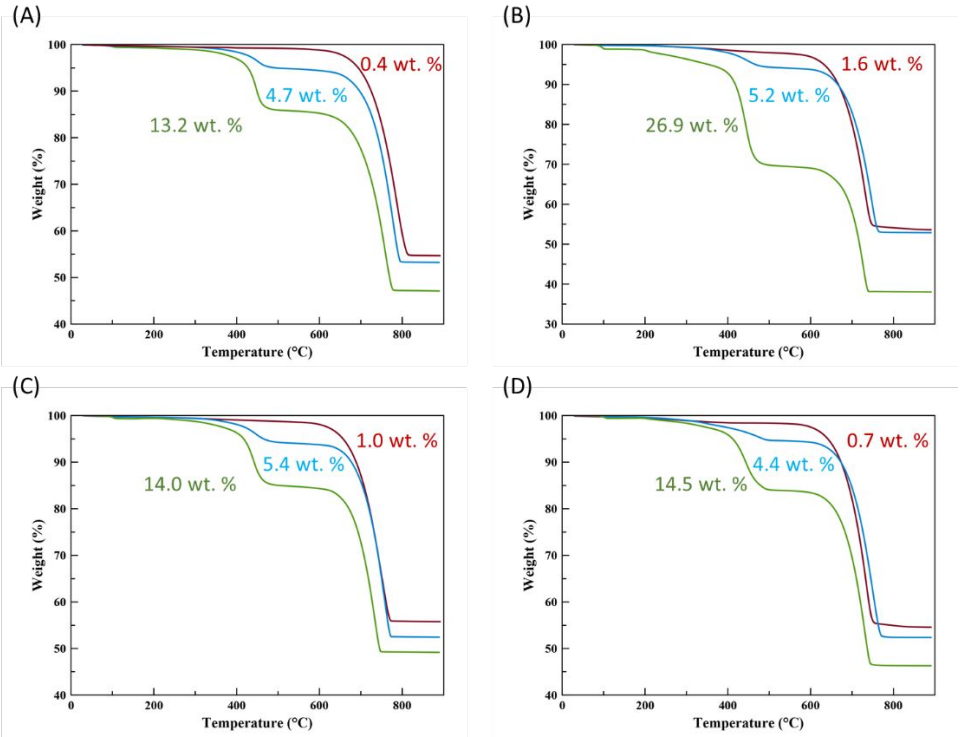

Figure S6. TGA profiles of bleached powder of geogenic $CaCO_3$ (A), oyster shells (B), scallop shells (C) and clam shells (D) (red) and corresponding coated powder with 40 mM (blue) and 400 mM aqueous sodium stearate (green) solutions.

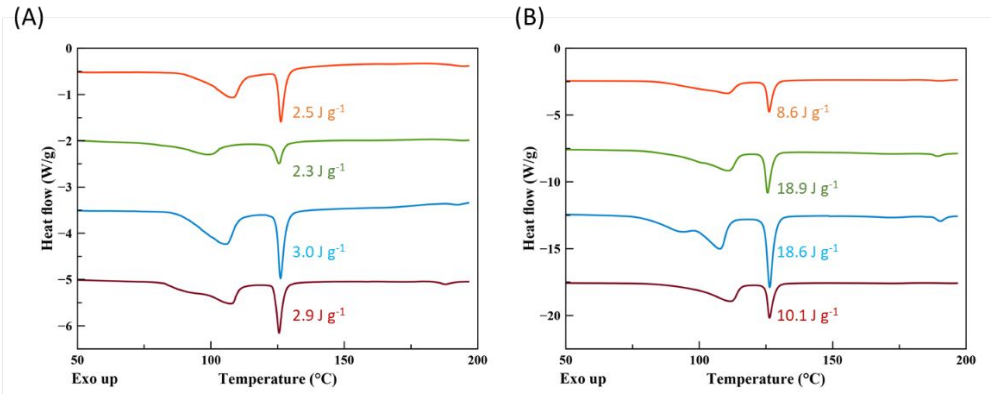

Figure S7. DSC profiles of powder of geogenic $CaCO_3$ (red), oyster shells (blue), scallop shell (green) and clam shell (orange) coated with 40 mM (A) and 400 mM (B) aqueous sodium stearate solutions.

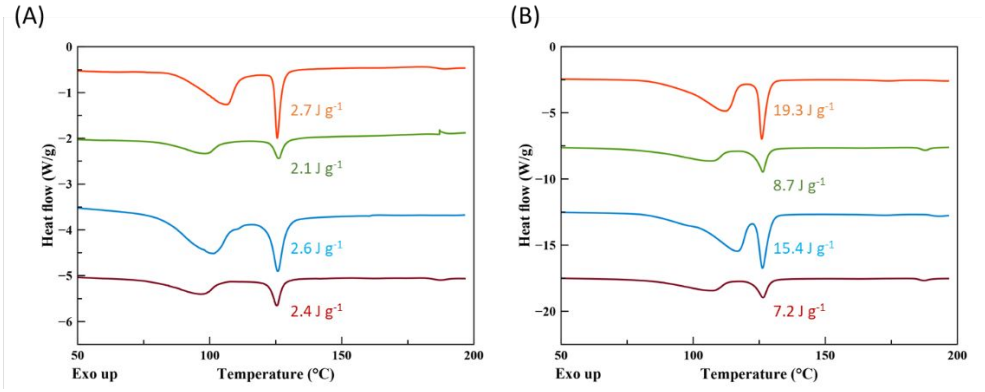

Figure S8. DSC profiles of powder of bleached geogenic $CaCO_3$ (red), oyster shells (blue), scallop shells (green) and clam shells (orange) coated with 40 mM (A) and 400 mM (B) aqueous sodium stearate solutions.

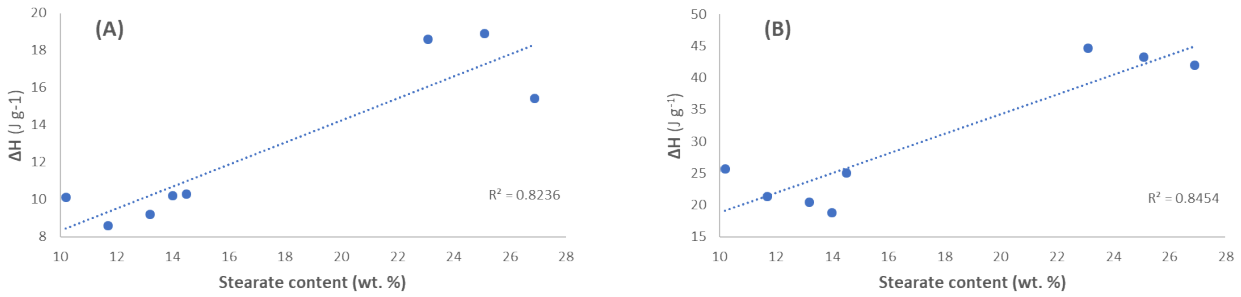

Figure S9. Relationship between the dehydration enthalpy (A) and the crystalline-to-smectic transition enthalpy (B) for the Ca stearate layer adsorbed on the $CaCO_3$ particles surface versus the adsorbed percentage of stearate.

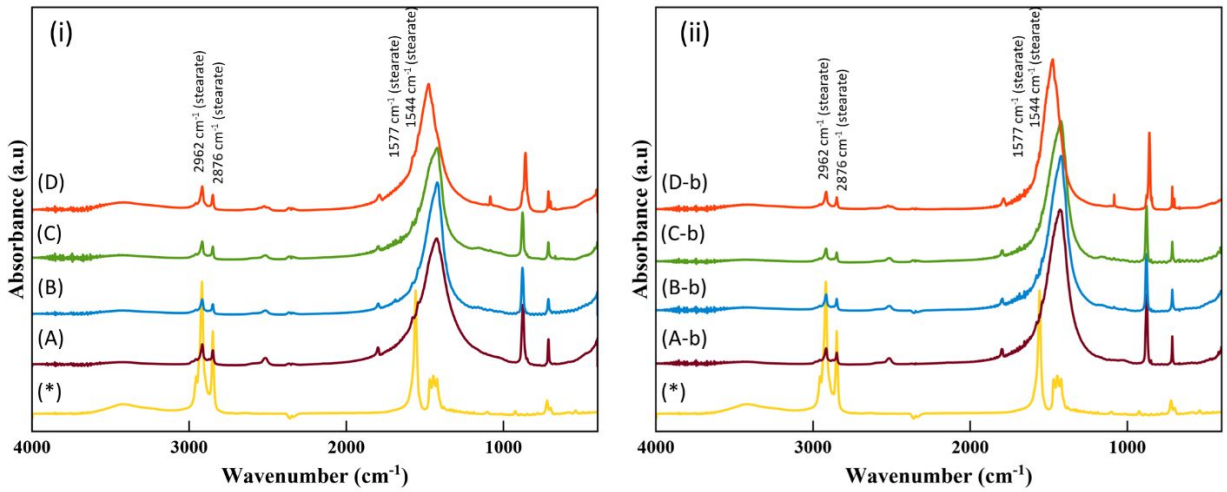

Figure S10. FTIR spectra of unbleached and bleached powders (A) geogenic $CaCO_3$, (B) oyster shells, (C) scallop shells and (D) clam shells coated using a 40 mM stearate solution. (i) unbleached $CaCO_3$ samples. (ii) bleached $CaCO_3$ samples. (*) Sodium stearate FTIR spectrum.

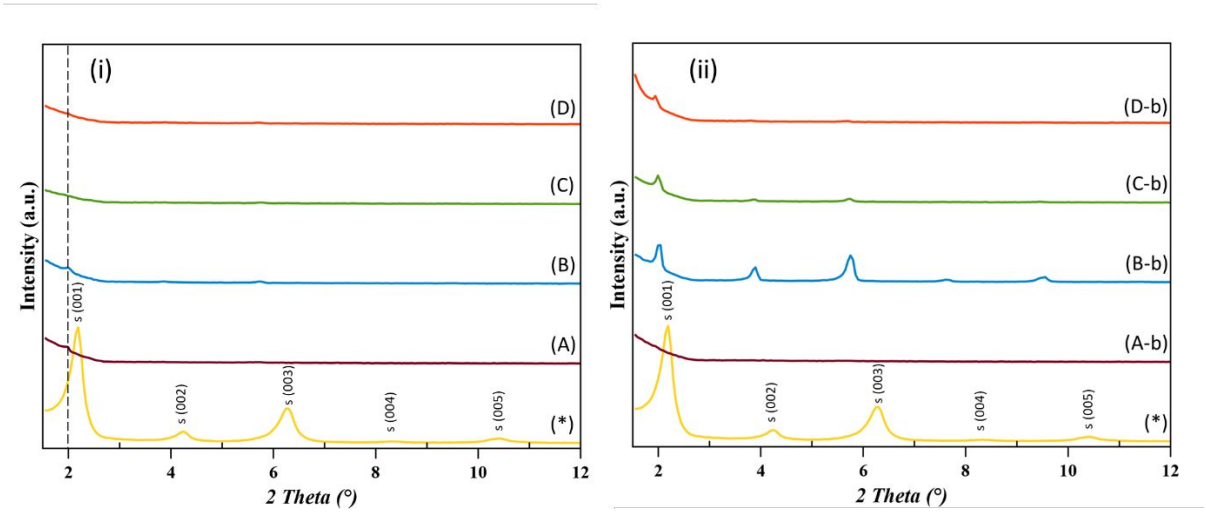

Figure S11. X-ray powder diffraction patterns of unbleached and bleached powders (A) geogenic $CaCO_3$, (B) oyster shells, (C) scallop shells and (D) clam shells coated using a 40 mM stearate solution. (i) unbleached $CaCO_3$ samples. (ii) bleached $CaCO_3$ samples. (*) Sodium stearate X-ray powder diffraction pattern.

Table S1. Colorimetric analysis of particles of: (A) geogenic $CaCO_3$; (B) oyster shells, (C) scallop shells; (D) and clam shell powders. The suffix -b indicates the samples that were subject to a bleaching/grinding process.

Sample	L*	a*	b*	dE^*_{ab}*
A	92.53	0.99	6.57	7.48
B	90.34	0.63	4.35	6.71
C	89.43	2.04	5.46	8.37
D	87.86	0.64	6.61	9.90
A-b	92.61	0.98	6.81	7.42
B-b	92.52	0.22	3.55	4.57
C-b	91.12	1.89	5.33	7.36
D-b	92.09	0.67	3.81	5.12

The dE_{ab} values were calculated as follow: $dE^*_{ab} = \sqrt{(L^*_C - L^*)^2 + (a^*_C - a^*)^2 + (b^*_C - b^*)^2}$. L^*_C, a^*_C and b^*_C are the colorimetric values of the control $BaSO_4$.