Supplementary Materials

Turning Seashell Waste into Electrically Conductive Particles

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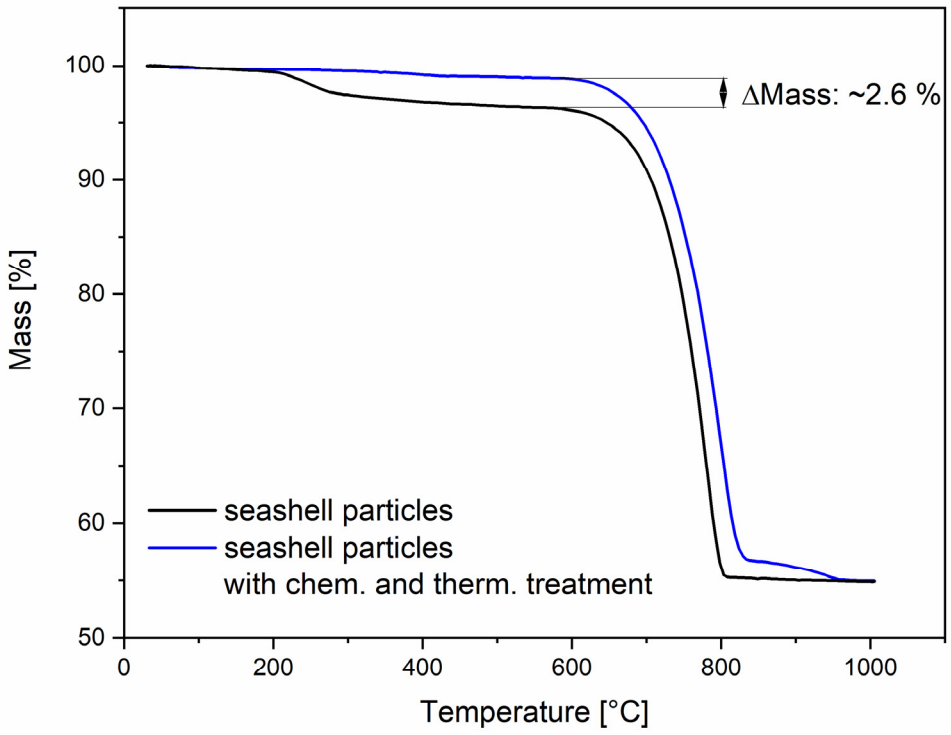

Figure S1. TGA image of seashell particles (black) andseashell particles that have been chemically and thermally treated to remove the organic content (blue).

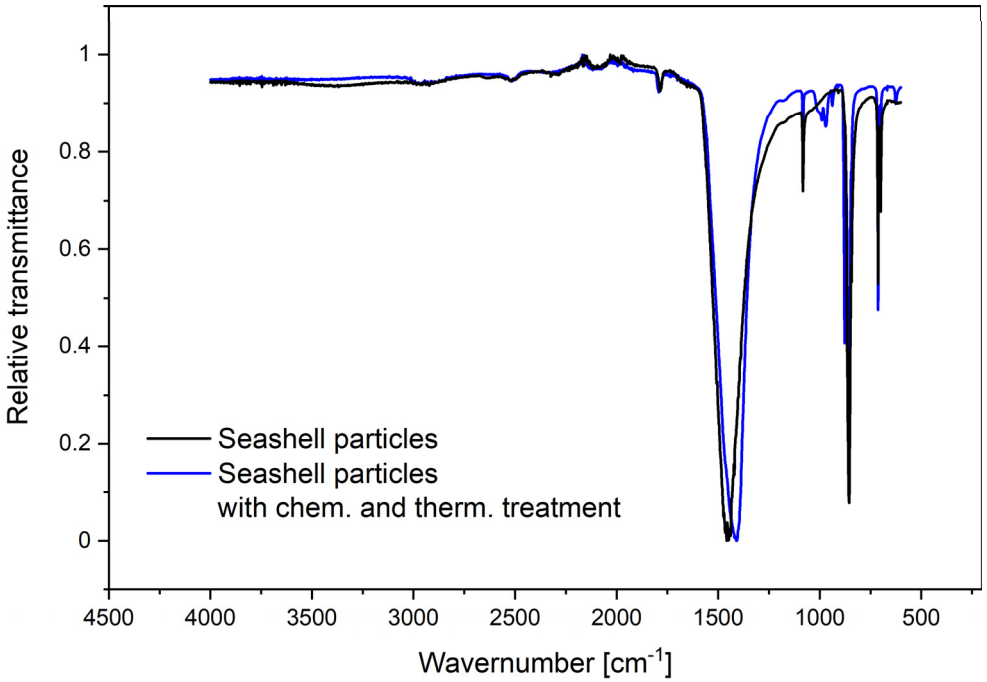

Figure S2. ATR-IR image of seashell particles (black) and seashell particles that have been chemically and thermally treated to remove the organic content (blue). The characteristic peaks at 1410 cm^{-1}, 1082 cm^{-1}, 857 cm^{-1}, 712 cm^{-1}, and 700 cm^{-1} are consistent with those of aragonite.

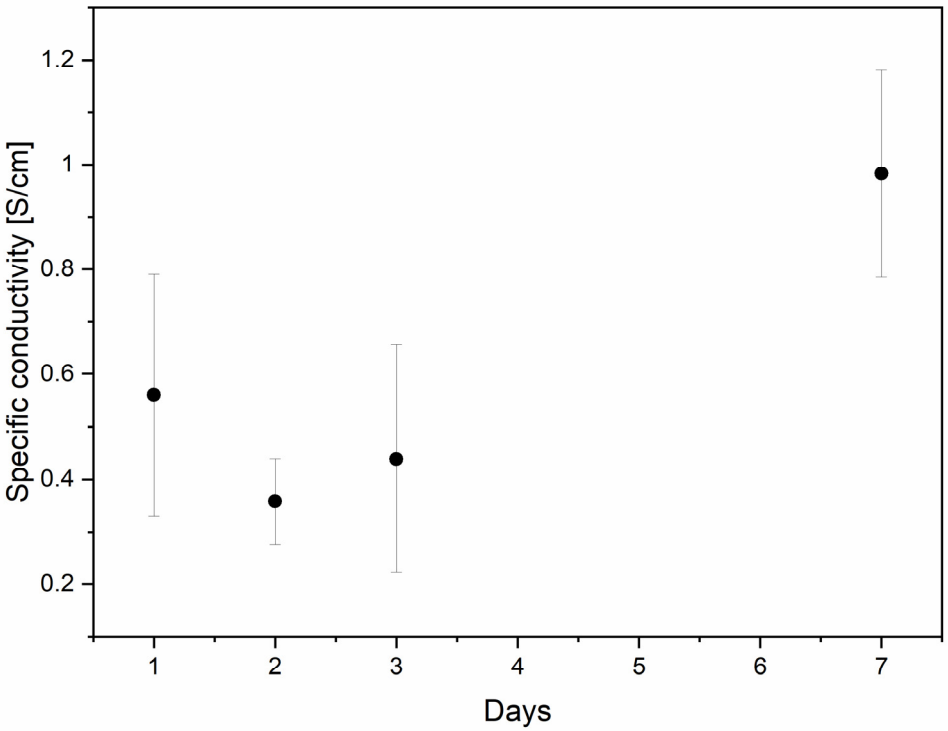

Figure S3. Specific conductivity of PPy/$CaCO_3$ composites (PPy/$CaCO_3$ 3 material) with different doping durations (1, 2, 3, 7 days).

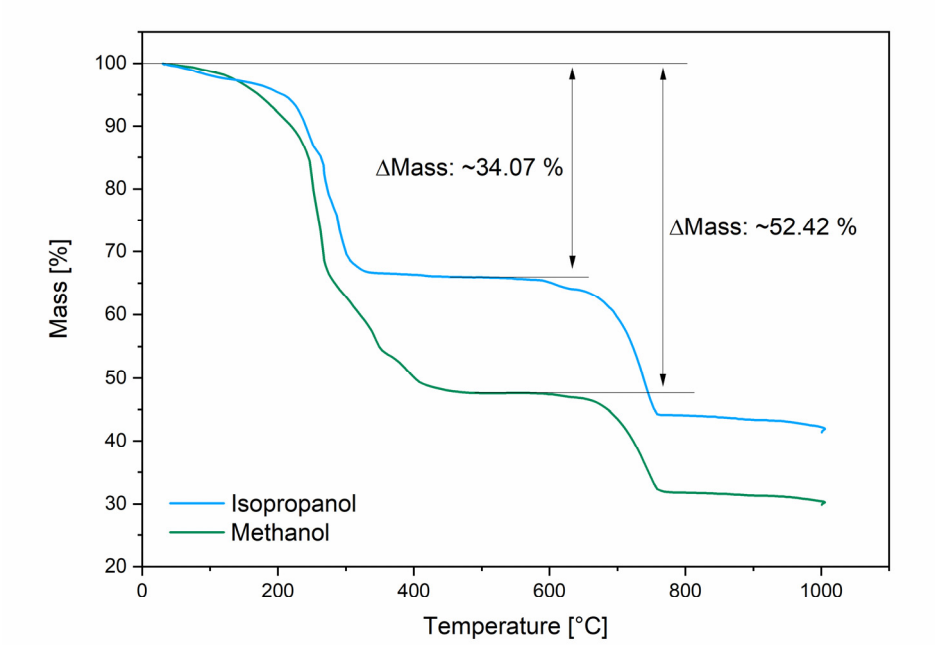

Figure S4. Comparing the polymer amount, which was measured with TGA, of PPy/$CaCO_3$ composite materials (PPy/$CaCO_3$ 5 and 6) which were formed in different solvents: Isopropanol and methanol.

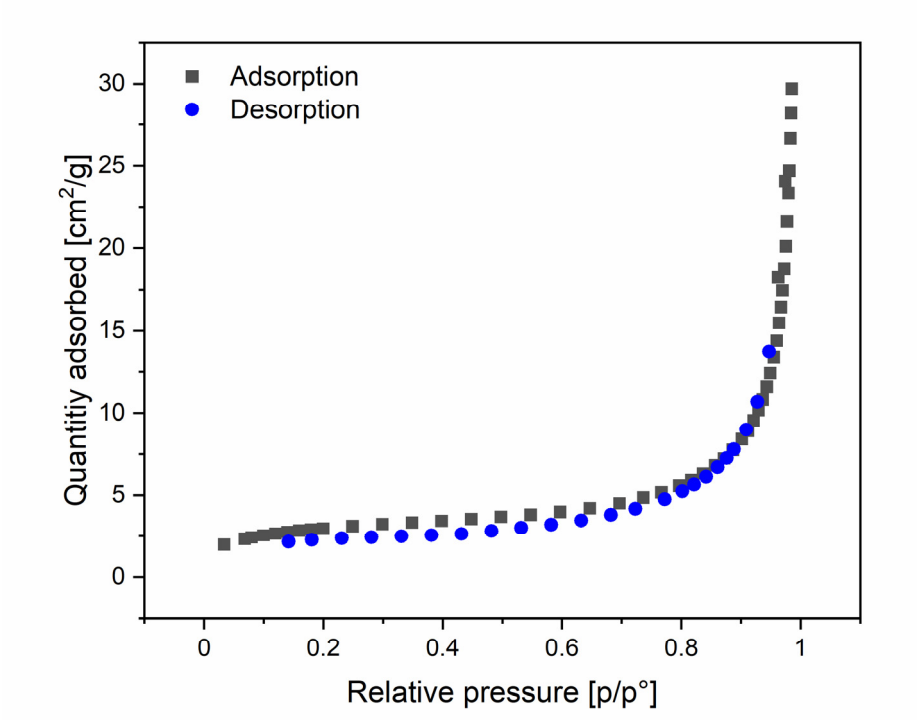

Figure S5. Nitrogen adsoprtion and desorption isotherm for PPy/$CaCO_3$ composite

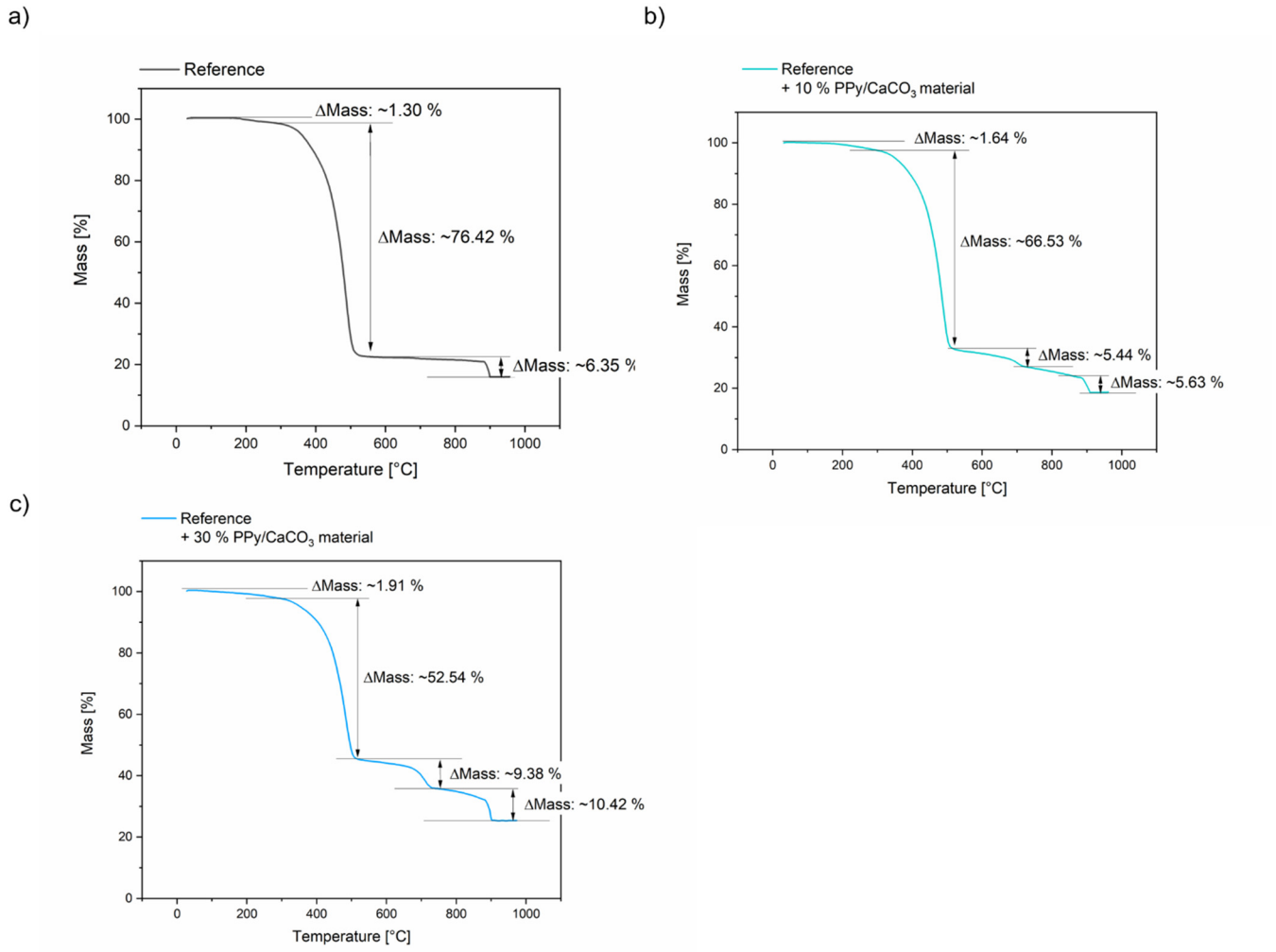

Figure S6. Thermogravimetric analysis of the reference sample Levirex® LX B/518 (**a**), PPy/$CaCO_3$ particles (30 wt % and 10 wt%) added to sole material. PPy/$CaCO_3$ particles (30 % (**b**) and 10 % (**c**)) molded in sole material Levirex® LX B/282.

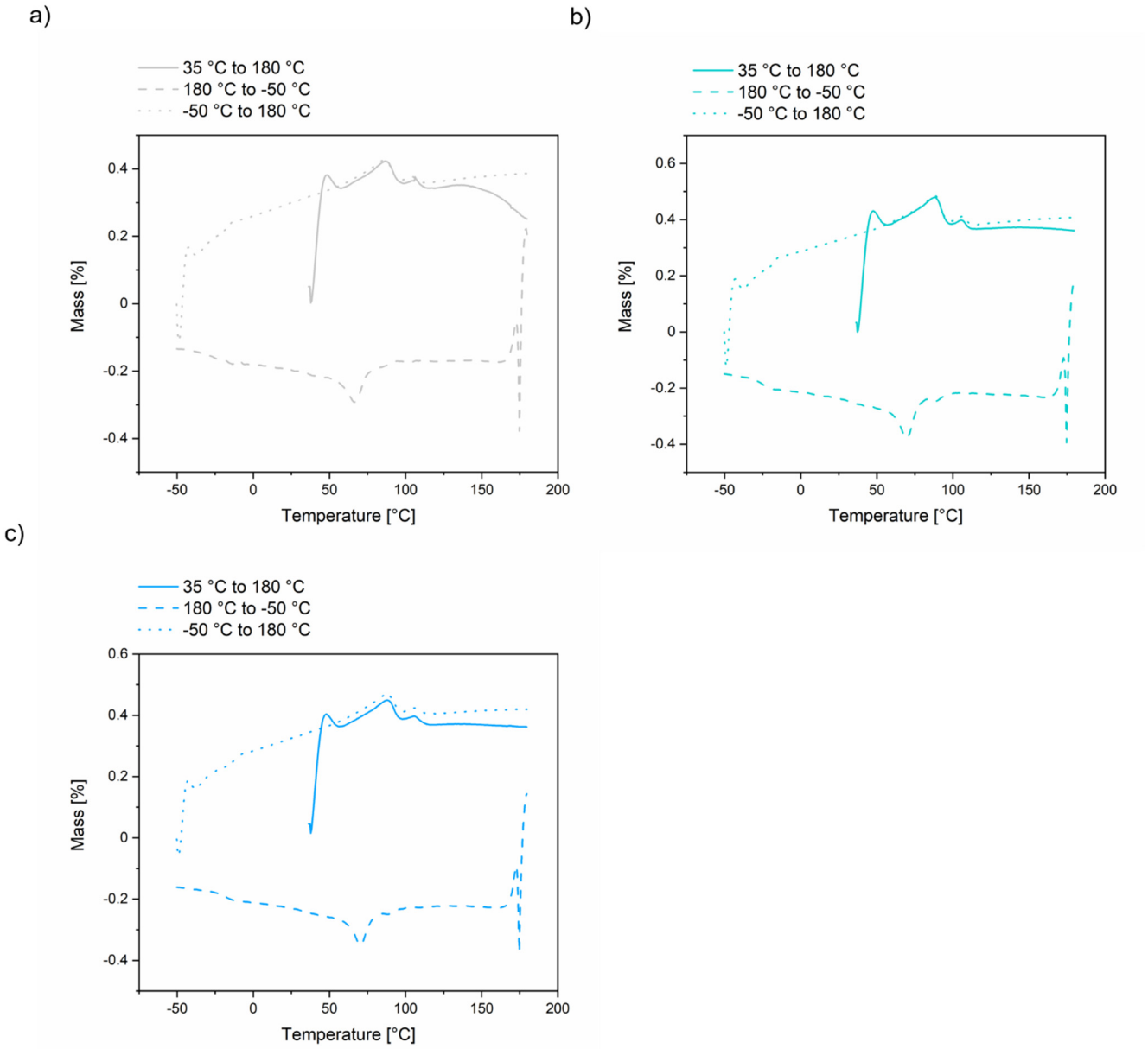

Figure S7. Differential scanning calorimetry of the reference sample Levirex® LX B/518 (**a**), PPy/$CaCO_3$ particles (30 wt % and 10 wt%) added to sole material. PPy/$CaCO_3$ particles (30 % (**b**) and 10 % (**c**)) molded in sole material Levirex® LX B/282.

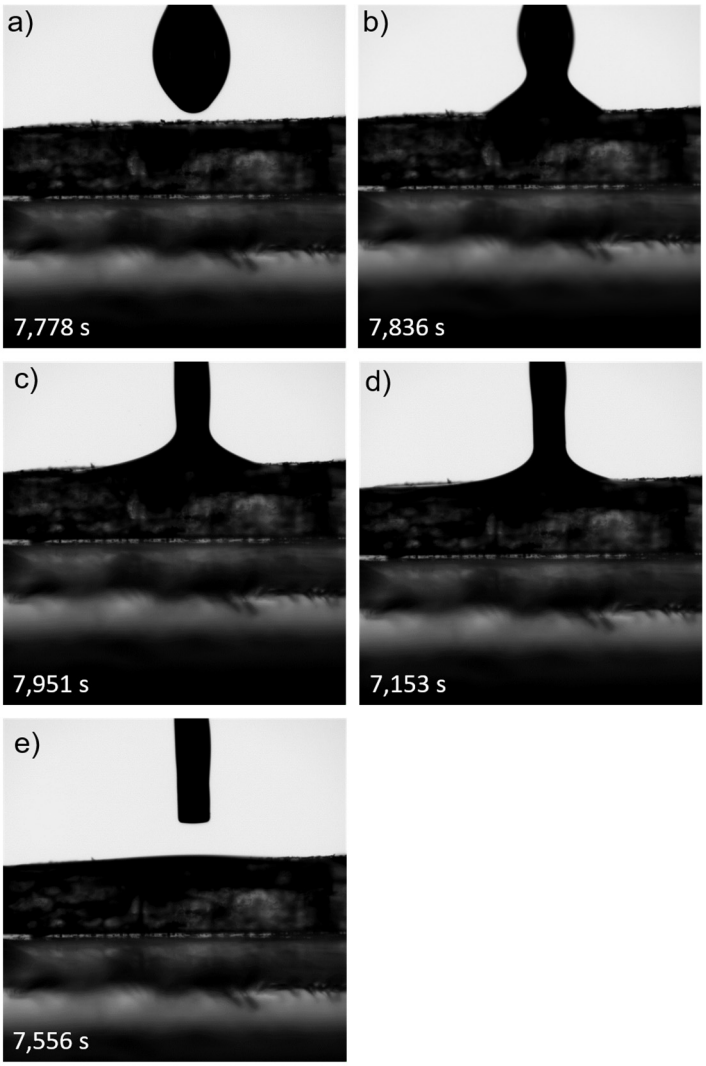

Figure S8. Contact angle measurement of pyrrole/methanol (2:1) mixture on a calcite surface.