



**Figure S4.** TGAs of polymer (top), polymer-cements, and control cements (bottom), heated at a rate of 10 °C/min under N2.

**Table 2.** Total carbon values for cement and polymer-cement samples as synthesized and after heating in a TGA-DSC from 20 to 300 °C at 10 °C/min and holding at 300 °C for 12 hours under N2.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| w:c | Polymer (wt%) | Before/after  heating | Wt% Total Carbon | Wt% Total Organic Carbon | Wt% Total Inorganic Carbon |
|
|
| 0.54 | 0 | before | 0.56\* | 0.30\* | 0.26\* |
| 0.71 | 10 | before | 1.78\* | 1.00\* | 0.78\* |
| 0.86 | 25 | before | 5.07\* | 4.02\* | 1.05\* |
| 0.54 | 0 | after | 0.47\*\* | N/A | N/A |
| 071 | 10 | after | 1.66\*\* | 0.62\*\* | 1.04\*\* |
| 0.86 | 25 | after | 4.32\*\* | 2.79\*\* | 1.53\*\* |

\* Average from triplicates, \*\* Average from duplicates.

TOC and TGA analysis suggests that a significant fraction of the polymer remains present at these temperatures with water being the main component released during thermal exposure, as is also the case for conventional cement. While it is difficult to extrapolate from short term TGA testing to long-term temperature stability, these results suggest that the polymer-cement composites may be stable at most EGS temperatures.