Supporting Information

Complex calcium carbonate aggregates: Controlled crystallization and assembly via an additive-modified positive-microemulsion-route

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Figure S1 FT-IR spectra of the products obtained in glycin/microemulsion after reacting for 10 min (a), 30 min (b), and 24 h (c).

Figure S2 SEM image (a) and X-ray diffraction patterns (b) of CaCO₃ crystals obtained in microemulsion after reacting for 24 h.
Figure S3 XRD patterns of crystals obtained in dual template (microemulsion/ Mg\(^{2+}\)) after 72h of reaction. ((Mg\(^{2+}/\) Ca\(^{2+}\)) (molar ratio): (a) 1, (b) 3, and (c) 4.

\[
\text{C}_8\text{H}_{17}-\overset{\text{O}}{\text{C}}-\text{O(CH}_2\text{CH}_2\text{O)}_n\text{H}
\]

Scheme S1 Possible structural formula of octyl phenyl poly(ethylene oxide)-n (n= 4 or 10)
Figure S4 XPS spectra of crystals obtained in dual template (microemulsion / Mg$^{2+}$) ((Mg$^{2+}$ / Ca$^{2+}$) (molar ratio): a 1; c 4). (a, c) XPS survey scan of the crystals, (b, d) the high-resolution XPS spectrum of particles for Mg). The peaks at 1305.4 eV displayed in Figure S4b and d can be attributed to Mg 1s. The amount of Mg$^{2+}$, determined through XPS quantification, was 3.5 wt % corresponding to sample(a) (figure S4 a), and the 5.23 wt % of Mg$^{2+}$ could be coated on the surface of sample(c) (figure S4 c).

Table S1 Percentage content of Mg in the crystals obtained in dual template (microemulsion / Mg$^{2+}$) ((Mg$^{2+}$ / Ca$^{2+}$) (molar ratio): a 0.025; b 4) determined by ICP-AES measurement.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Percentage Content (wt %)</th>
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<tbody>
<tr>
<td>a</td>
<td>5.65</td>
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<tr>
<td>b</td>
<td>6.71</td>
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