Supporting Information

**Figure S1.** TGA curve of CaCO$_3$ particles obtained under control of 0.1g/l NaCMC after 10min reaction.

**Figure S2.** TGA curve of CaCO$_3$ particles obtained under control of 0.1g/l NaCMC after 60min reaction.
Figure S3. TGA curve of CaCO$_3$ particles obtained under control of 1g/l NaCMC after 60min reaction.

Figure S4 TGA curve of CaCO$_3$ particles obtained under control of 5g/l NaCMC after 60min reaction in scCO$_2$.