



Figure S2: In-situ X-ray diffraction patterns during heating of  $\text{Ca}_6(\text{C}_{12}\text{H}_{14}\text{O}_4)_4(\text{CO}_3)(\text{OH})_2(\text{H}_2\text{O})_x$ .

The initial phase contains water, which is gradually removed by the heating. This is clearly seen by the decrease in intensity of the first reflection. The structure remains stable up to 200 °C, where most of the reflections disappear. However 4 reflections remain up to 257 °C, indicating that the new structure is somehow related to the previous. This new structure has not been indexed.

At 257 °C the new structure decomposes forming a mixture of  $\text{Ca}(\text{OH})_2$  and  $\text{CaCO}_3$ . At 315 °C  $\text{Ca}(\text{OH})_2$  decomposes to  $\text{CaO}$ .