



Fig. 1. Vertical and horizontal chemical garden (CG) and variants with decanol added (CGD). In (A) CG: Calcium chloride seeds were dropped upon sodium silicate solution. In (B) CGD, calcium chloride seeds were dropped onto a decanol-silicate two-phase system. In (C) CGD after mixing, calcium chloride seeds dropped upon a decanol-silicate mixed two-phase system. In (D) horizontal variant of the CG system and (E) horizontal variant of the CGD system. Scanning electron microscopy images of samples after 1 d (CG 1 (F) and CGD 1 (G)) and 1 mo (CG 1 (H) and CGD 1 (I)).

fitting for O1s can be found in *SI Appendix, Fig. S2B*). All these contributions confirm the presence of sodium silicate in our samples.

Moving to high-resolution short-range spectra, we noticed that Na1s core level analysis of CG (two out of three) and CGD

(one) samples show the second Na1s high BE peak that can be correlated with the presence of NaCl. In addition, the short-range analysis for the Cl2p core level showed clearly also the presence of CaCl_2 in these samples. Furthermore, Na1s, Cl2p, and Ca2p are the three species shown in two distinct peaks for samples