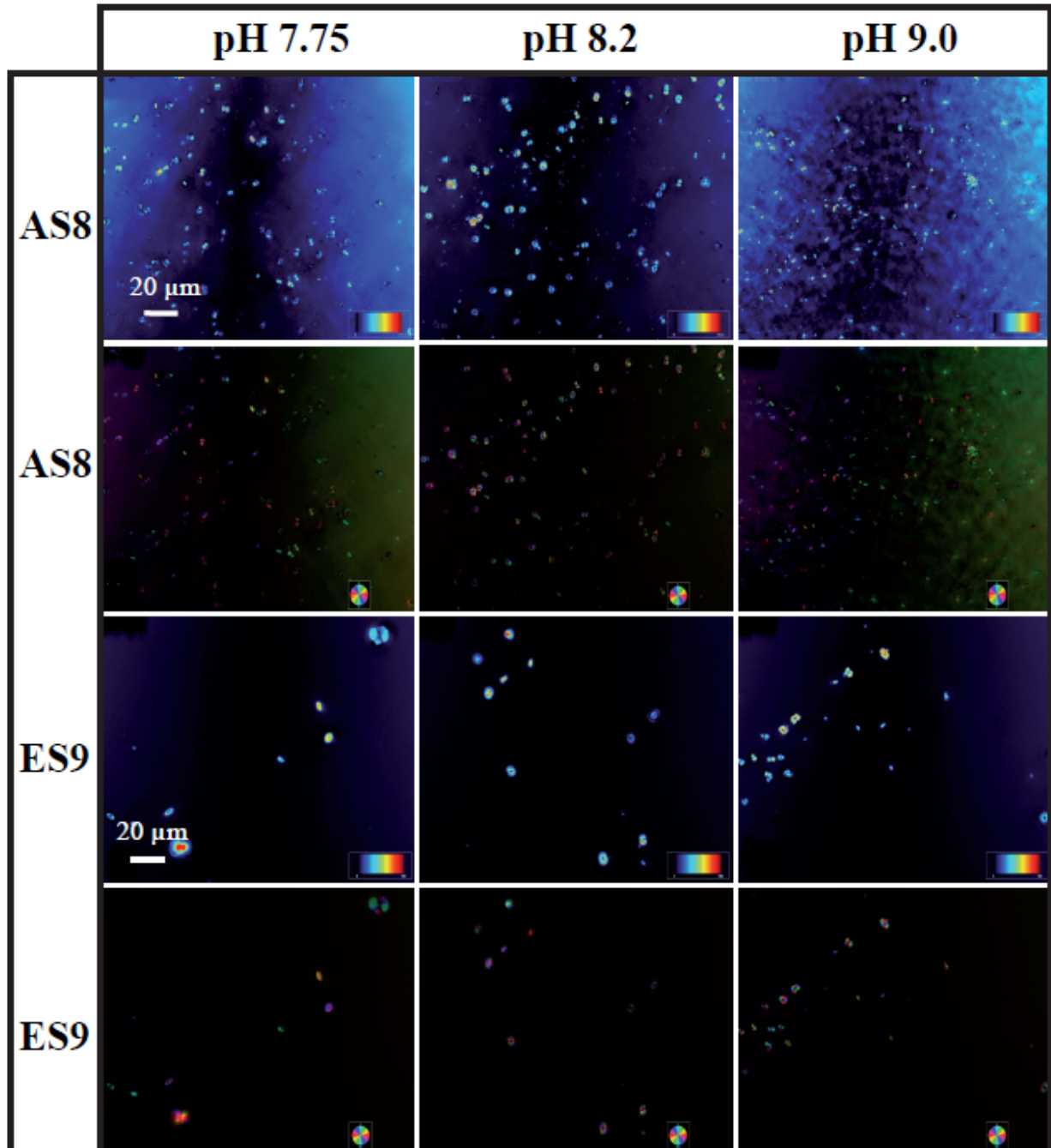
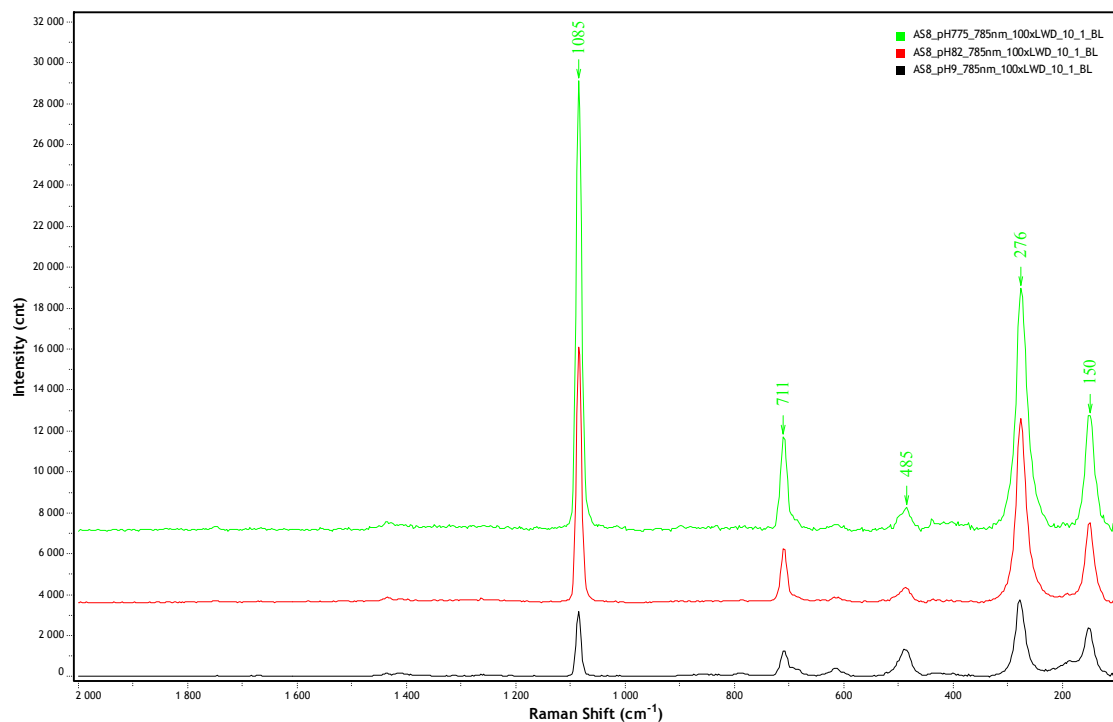


## Supplementary Information

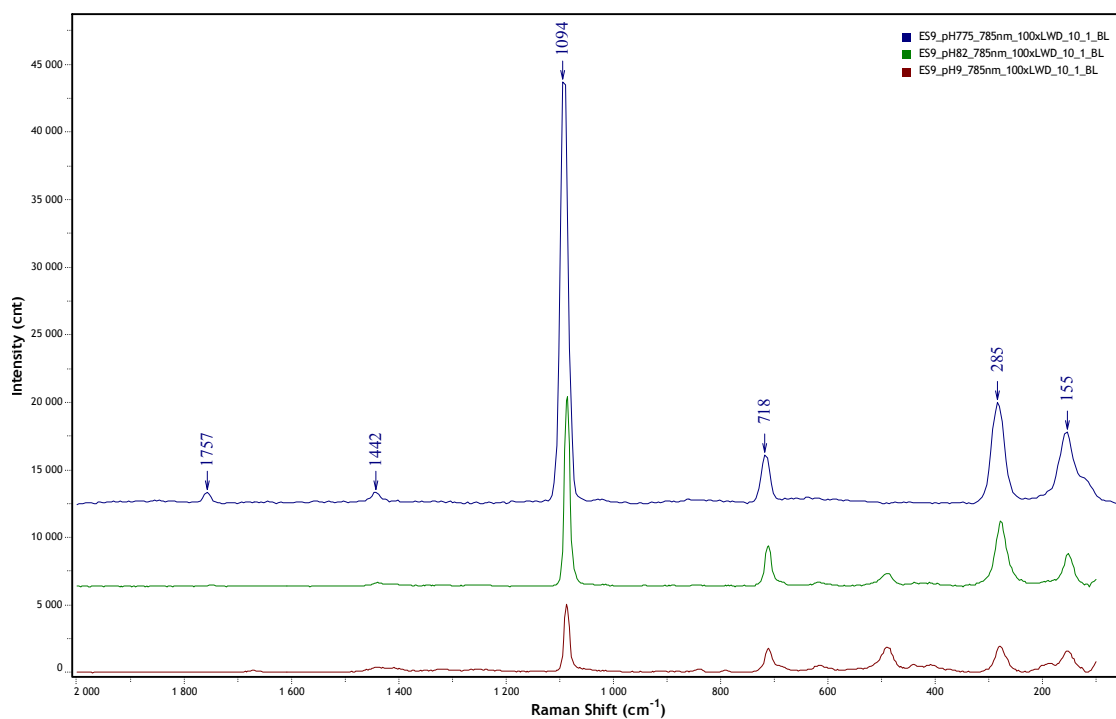
**Figure S1.** CaCO<sub>3</sub> crystals grown in presence of peptides AS8 and ES9 on flat wrinkle free substrate at three different pH values: LC-PolScope mode showing the birefringent retardance and orientation. The calcite does not show any defined morphology. Scale bar: 20  $\mu$ m.



**Figure S2.** Raman spectra of calcite obtained in the presence of peptide AS8.



**Figure S3.** Raman spectra of calcite obtained in the presence of peptide ES9.



**Figure S4.** EDS spectra, SE image and elemental mapping of C, N, O, F, Si, Cl and Ca at  $E = 10$  keV of peptide/Ca composites obtained under the influence of peptide AS8. (a) Peptide/Ca composites formed at pH 7.75; (b) Needle shaped peptide crystal formed at pH 8.2.

