

Support information for:

Calcium carbonate biomineralization utilizing a multifunctional β -sheet peptide template

Kazuki Murai,^a Masahiro Higuchi,^{*,a} Takatoshi Kinoshita,^b
Kenji Nagata^a and Katsuya Kato^{*,c}

^a *Department of Materials Science and Engineering and ^b Frontier Materials, Graduate School of Engineering, Nagoya Institute of Technology (NIT), Gokiso-cho, Showa-ku, Nagoya, Aichi, 466-8555, Japan.*

**E-mail: higuchi.masahiro@nitech.ac.jp (Prof. Dr. M. Higuchi)*

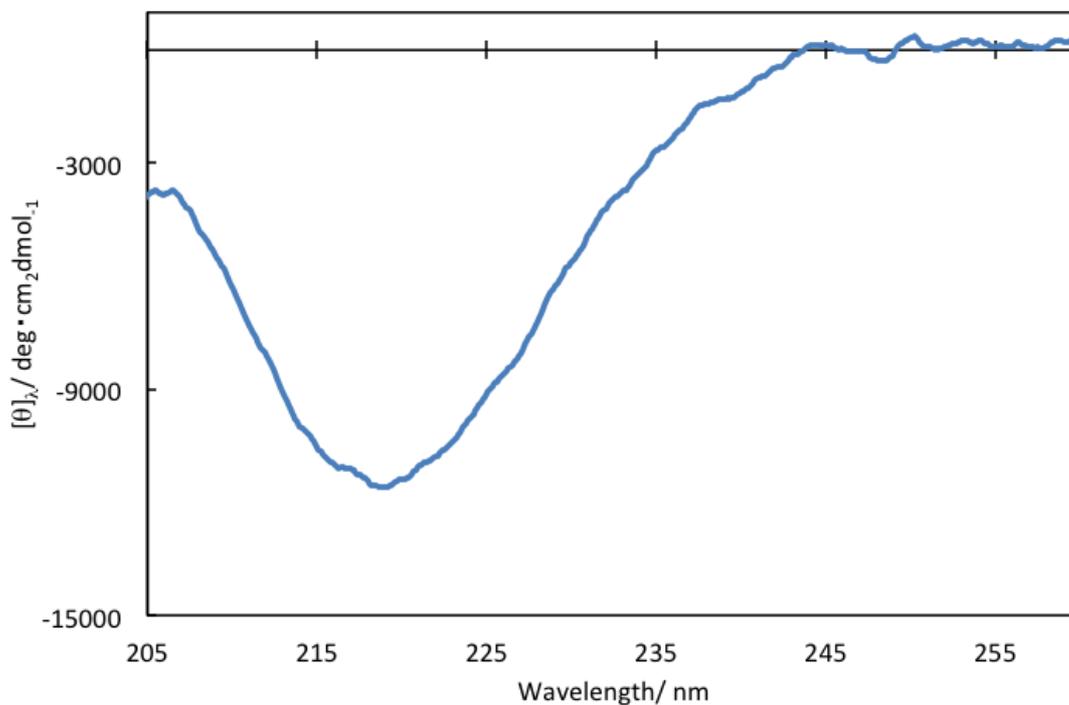
^c *Bio-Integrated Processing Group, Advanced Manufacturing Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), 2266-98, Anagahora, Shimosidami, Moriyama-ku, Nagoya, 463-8510, Japan.*

**E-mail: katsuya-kato@aist.go.jp (Dr. K. Kato)*

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S1. CD spectrum of peptide and the 2nd order structure in a mineralization system solution

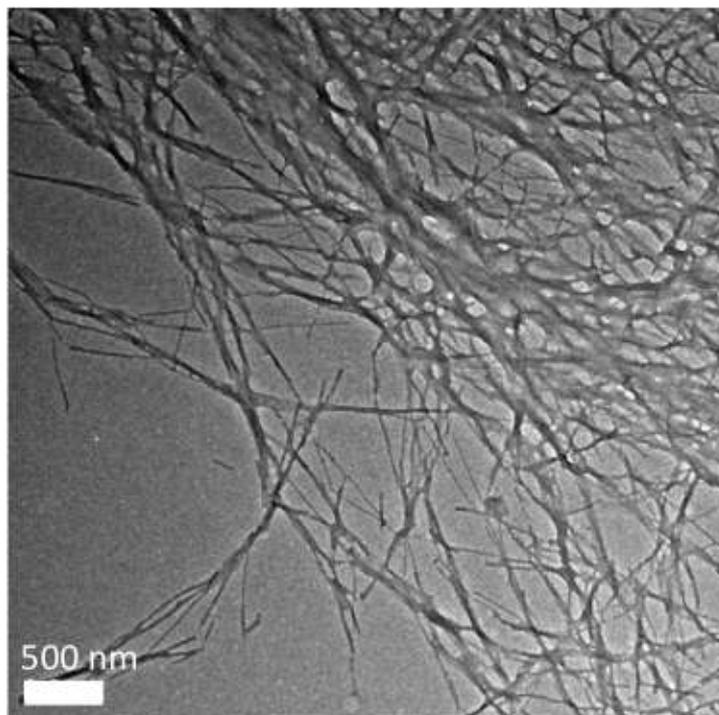
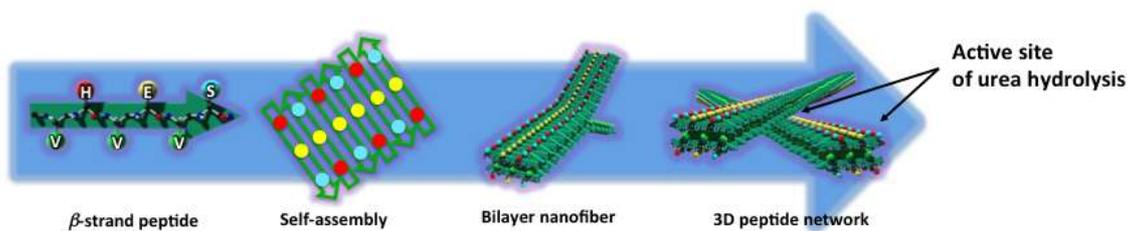


Condition	Conformation/ %		
	α -helix	β -sheet	Random coil
Mineralization system	0	77	23

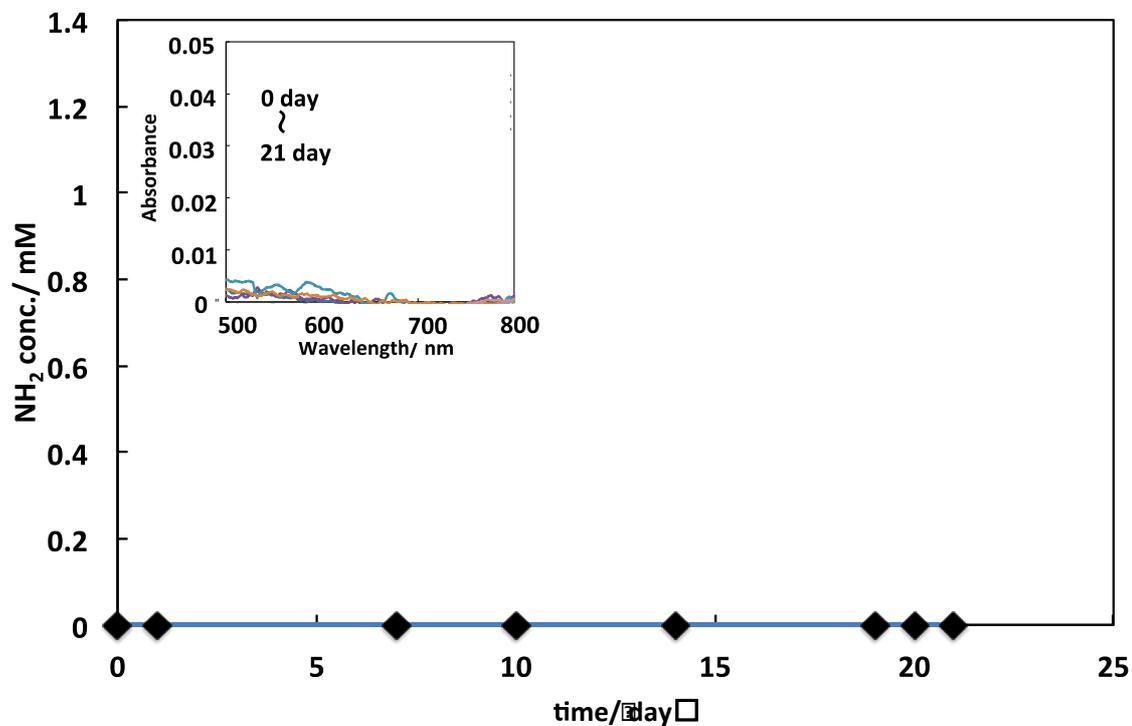
The secondary structure of peptide in mineralization system solution was determined by circular dichroism (CD, J-820, JASCO) measurement, under nitrogen atmosphere. Experiment was performed in a quartz cell with a 1 mm path length over the range of 205-260 nm. The Ac-VHVEVS-NH₂ peptide sample for CD measurement is prepared by addition the 0.5 ml of peptide aq. solution (1 mM) to the mixture containing 2 ml of urea (50 mM) and 2 ml of calcium acetate solution (50 mM).

The fraction of the secondary structure was calculated by using a curve-fitting method.

S2. The preparation of the Ac-VHVEVS-NH₂ peptide template by hierarchical self-assembly and the TEM image of peptide nanofiber

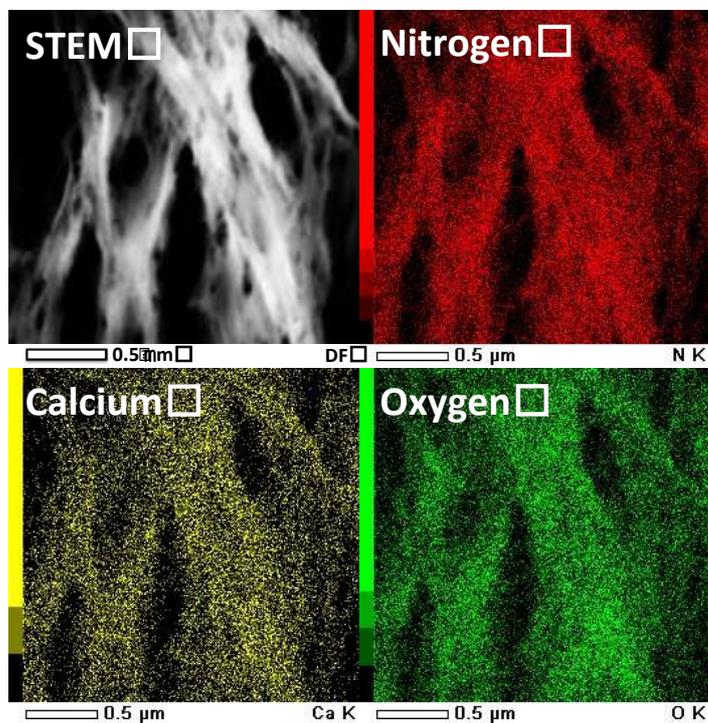


S3. The concentration change of the ammonia produced by the hydrolysis of the urea in the control system.

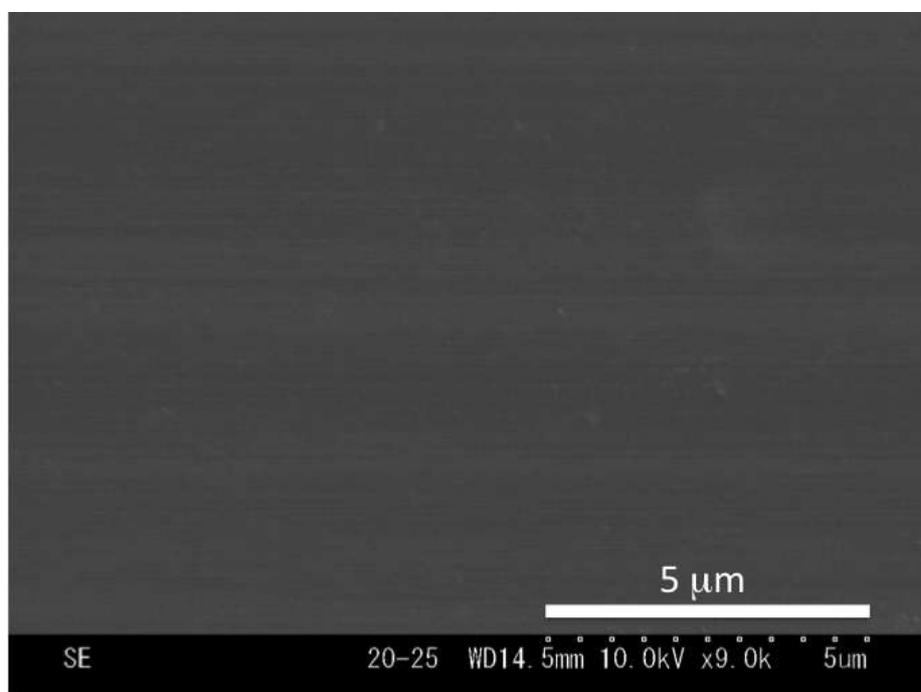


The inset shows UV-vis absorption spectral change of the generated indophenol by the reaction with ammonia produced by the hydrolysis of the urea.

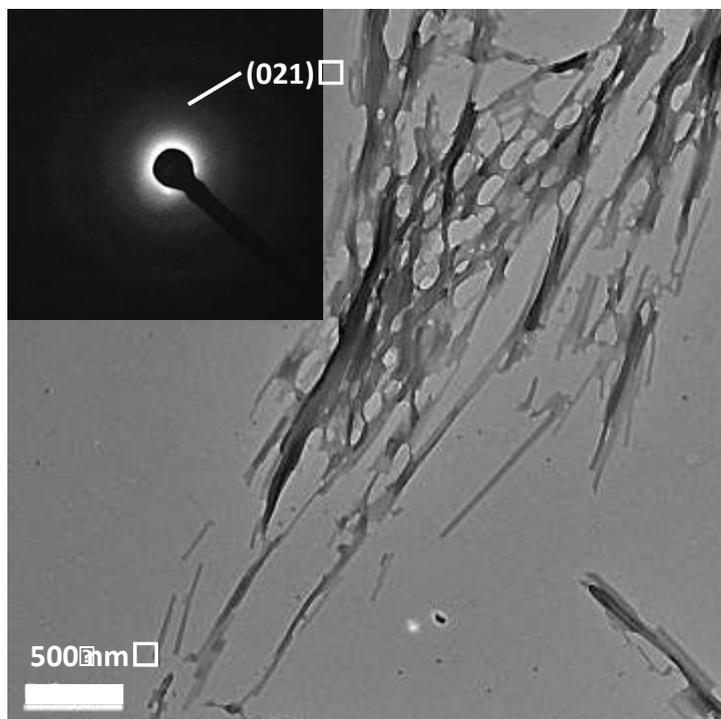
S4. EDX mapping images of the CaCO_3 -peptide hybrid materials



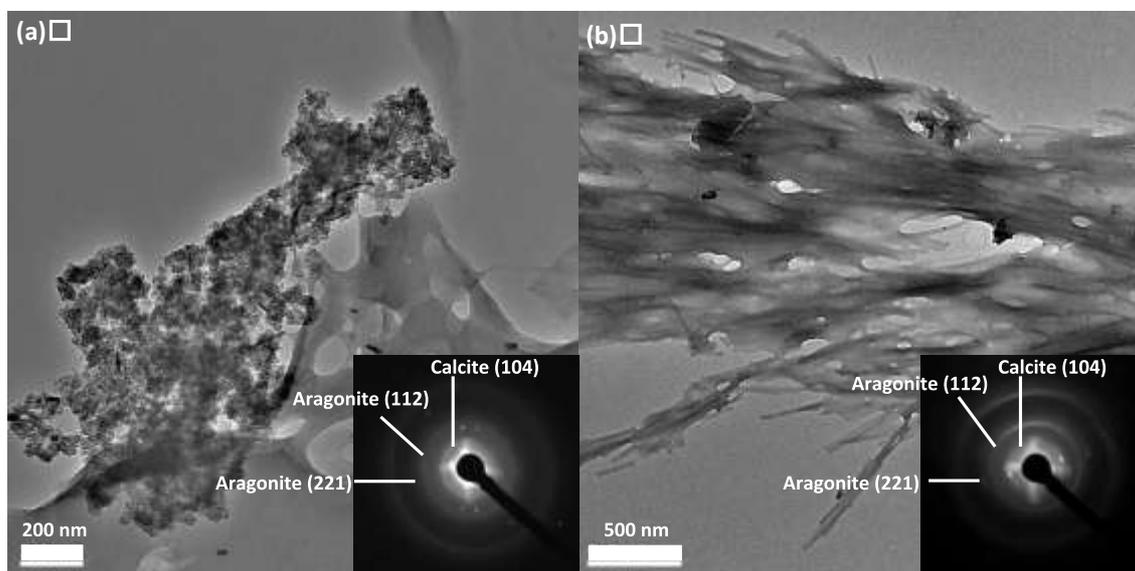
S5. SEM image of CaCO₃ mineralized on control system



S6. TEM image of the CaCO_3 obtained by self-supplied mineralization at early-stage, 7 days



S7. TEM images of the CaCO_3 obtained by externally-supplied mineralization at the different carbonate concentration after 3 days



TEM images of the CaCO_3 obtained by the externally-supplied mineralization at (a) 0.3 mM and (b) 0.15 mM CO_3^{2-} concentrations.