Supporting Information

"Atomic Force Microscopy Imaging of Crystalline Sucrose in Alcohols"

Yuya Teduka, Akira Sasahara, Hiroshi Onishi*

Department of Chemistry, School of Science, Kobe University, Rokko-dai, Nada, Kobe, Hyogo, 657-8501 Japan

1. Shape of sucrose crystals. A typical crystal prepared in the aqueous solution is shown in Fig. S1. Crystallographic index of facets was assigned by comparing the shape of crystal to that reported in an earlier study.[S1] The black material embedded in the crystal is the string for suspending a seed crystal in the solution.

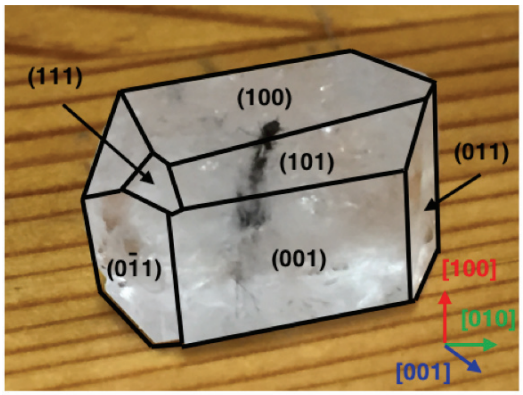

Figure S1. A sucrose crystal prepared in the aqueous solution. The length along the [010] axis was 2 cm. The photograph was taken by the authors.

2. Assignment of (001) facets by X-ray diffraction. (001) facets on the crystal were checked and confirmed by X-ray diffraction. Fig. S2 shows the diffraction pattern observed with a diffractometer (Rigaku, SmartLab) with a Cu Kα source in Hyogo Prefectural Institute of Technology. Three peaks appeared at $2\theta = 8.3$, 17.7 and 25.2 degree. These peaks were assigned to (001), (002) and (003) diffraction indicating that (001) planes were stacked parallel to the facet with a plane distance of 1.06 nm.

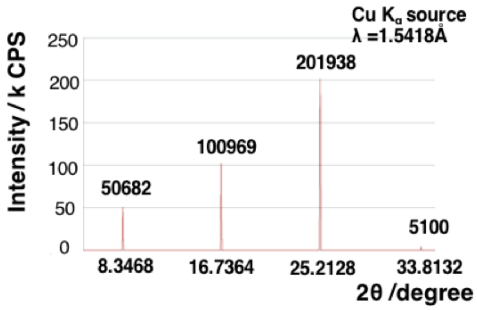

Figure S2. X-ray diffraction pattern of a (001) facet of crystalline sucrose.

3. Cantilever oscillation spectra in different alcohols.

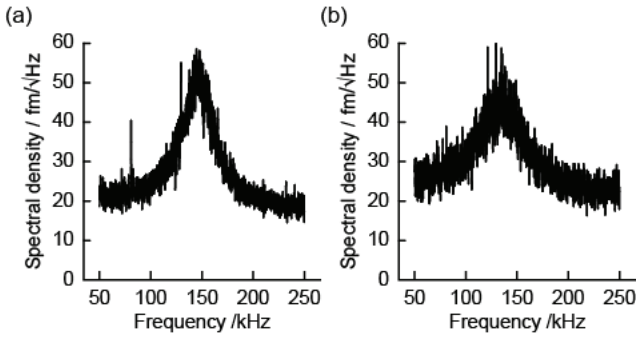

Figure S3. Thermally excited cantilever oscillation in (a) *n*-butanol and (b) *n*-octanol. The quality factor of resonance vibration was deduced to be 4.1 and 2.6 from the spectra in butanol and octanol, respectively. One common cantilever was used in observing the three spectra shown in Fig. 1 and Fig. S3.

4. Imaging in different alcohols.

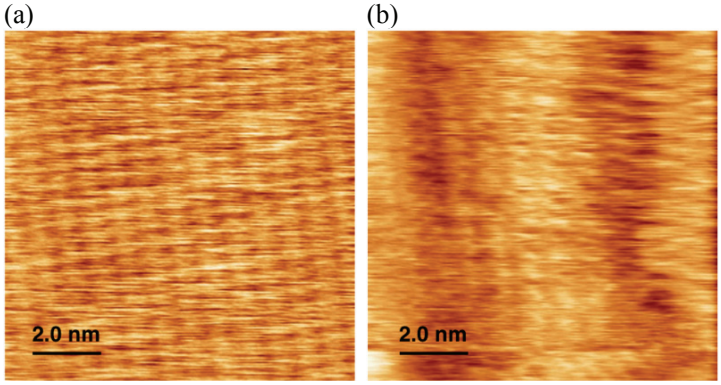

Figure S4. Sucrose molecules on a (001) terrace. Topography observed in (a) butanol and (b) octanol. Image size: 10 nm square. Δf: (a) +51 and (b) +36 Hz. A: (a) 0.76 and 0.87 nm.

References

(S1) Saska, M.; Myerson, A. S. The Theoretical Shape of Sucrose Crystals from Energy Calculations. *J. Cryst. Growth* **1983**, *61*, 546–555.