

Supplementary Information

Photoinduced Topographical Changes on Microcrystalline Surfaces of Diarylethenes: Versatile Shapes Generation Reflecting the Crystal Habit of Derivatives

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Table of Contents

1. DSC curves measured for a mixture of 4o and 4c .	S3
2. Absorption spectral changes of 4o in hexane solution.	S4
3. Thermal stability of 4c in decalin solution at elevated temperatures.	S5
4. Force curves obtained by SPM on single crystalline surfaces of 1o , 3o , and 4o .	S6
5. Relation between temperatures and slope of force curves indicating the hardness of the surface obtained by SPM on single crystalline surfaces of 4o .	S7
6. The XRD patterns of microcrystalline surfaces.	S10

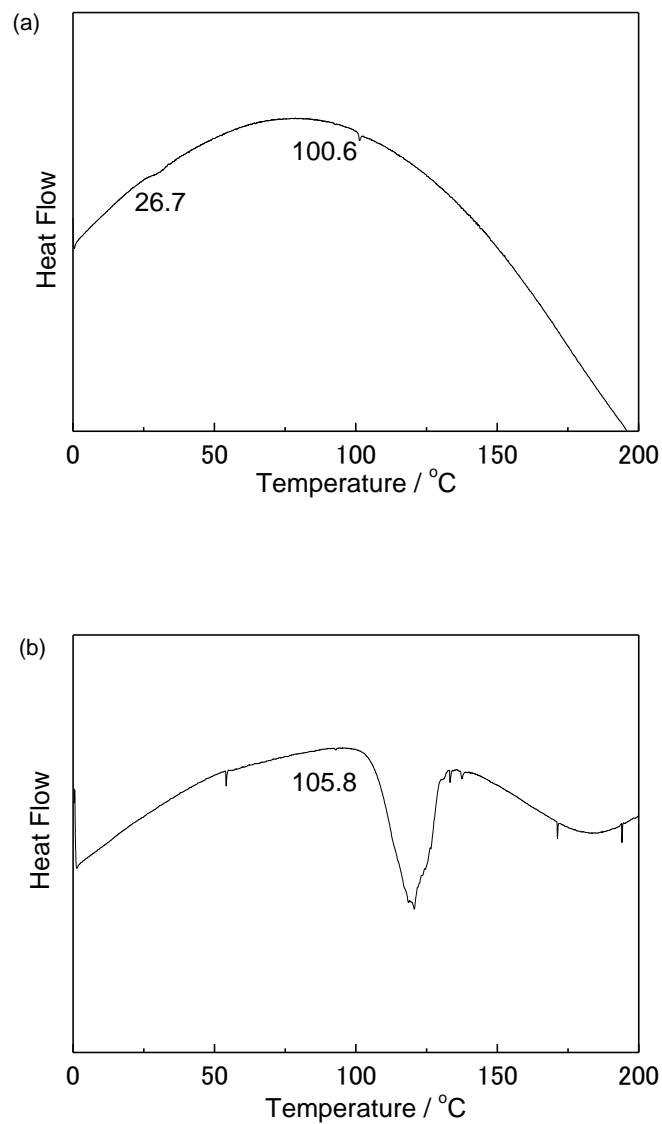


Fig. S1. DSC curves measured for the samples of (a) a mixture of **4o** and **4c** (**4o/4c** = 74.2/25.8) and (b) 100% of **4c** with heating rate of 5 °C/min. After DSC measurement the ratio of the **4c** was measured by absorption spectra, and found the contents were reduced from 25.8% to 10.5% for (a), and 100% to 17.1% for (b), respectively.

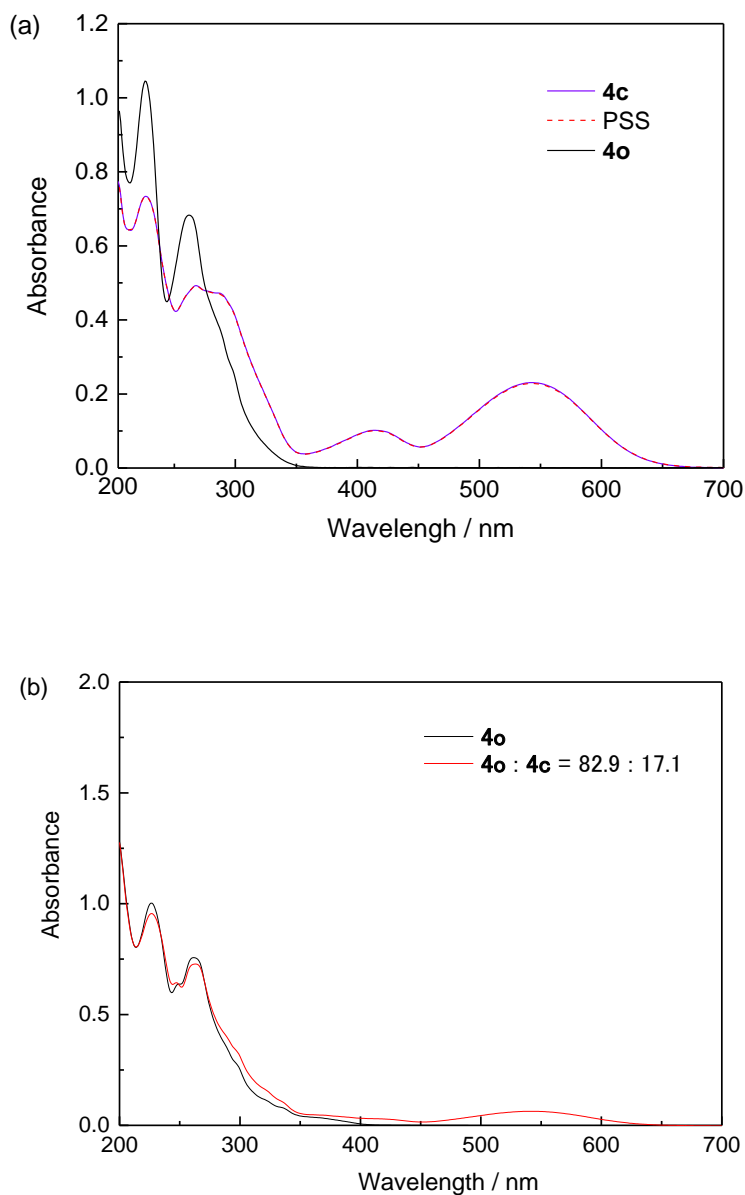


Fig. S2. (a) Absorption spectral changes of **4o** in hexane solution (3.55×10^{-5} mol/L). **4o**: black solid line, **4c**: purple solid line, photostationary state (PSS) upon UV irradiation (**4o**:**4c**=1:99): red broken line. λ_{\max} of **4o**: 267 nm (ϵ : 2.24×10^4 M $^{-1}$ cm $^{-1}$), λ_{\max} of **4c**: 542 nm (ϵ : 1.11×10^4 M $^{-1}$ cm $^{-1}$), (b) Absorption spectrum of **4o-4c** mixture after measurement of DSC (red-line) and the spectrum of **4o** upon visible light irradiation (black line). New band around 370 nm indicating decomposition product.

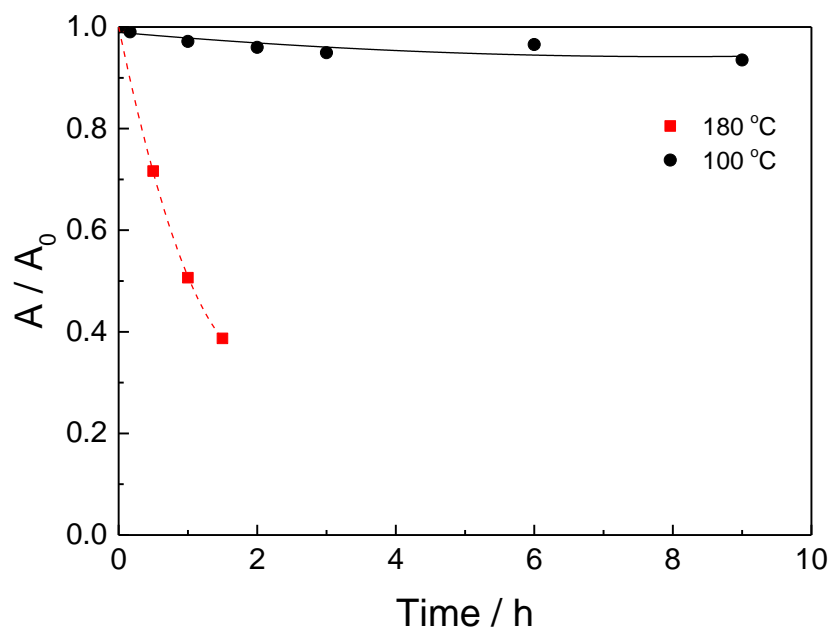


Fig. S3. Thermal stability of **4c** in decalin solution at elevated temperatures (monitored at 547 nm).

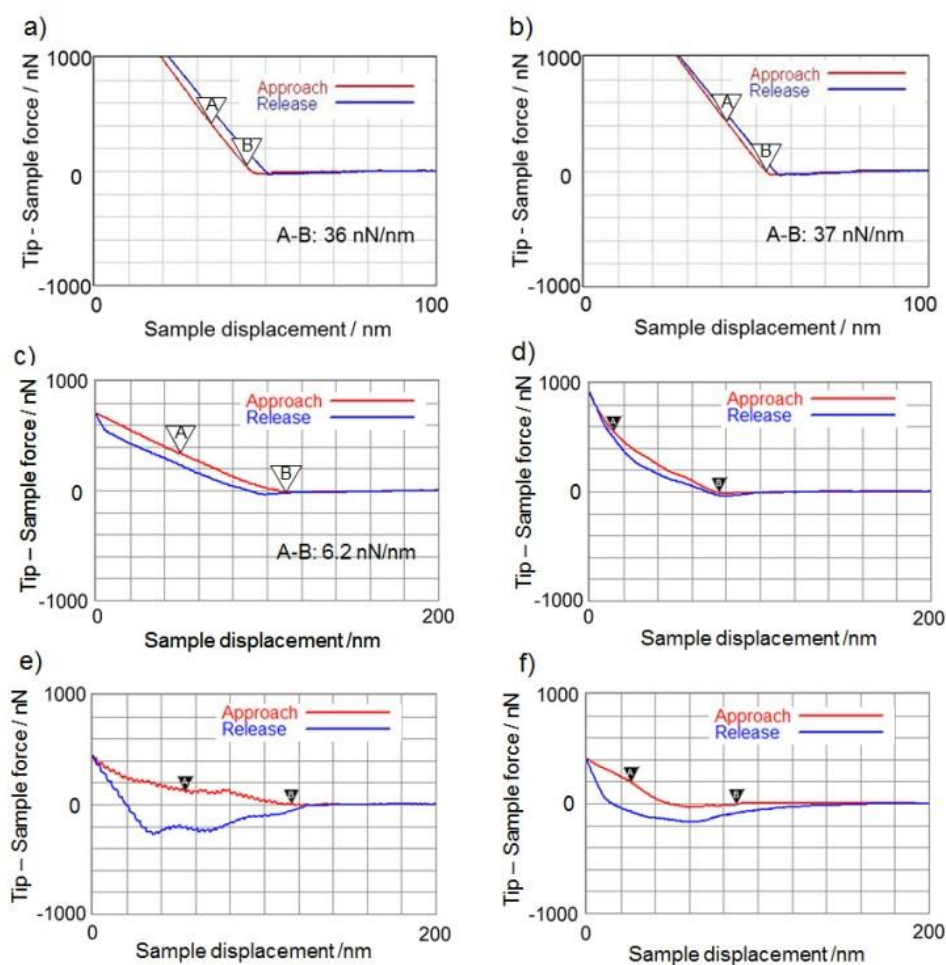


Fig. S4. Force curves obtained by SPM on single crystalline surfaces of **1o** ((a) before and (b) after irradiation with UV light at 22 °C. (c) before irradiation with UV light at 30 °C. (d) before irradiation with UV light at 50 °C. (e) before irradiation with UV light at 100 °C. (f) after irradiation with UV light at 30 °C.) Approach and release processes are depicted as red and blue lines, respectively. The speed of the approach and the release of the cantilever were both 100 nm/s. The spring constant was 42 N/m.

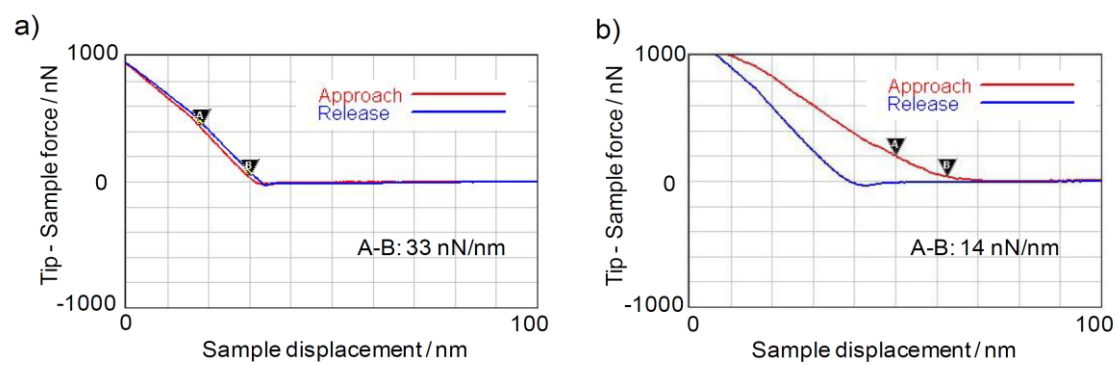


Fig. S5. Force curves obtained by SPM on single crystalline surfaces of **3o** at 30 °C ((a) before and (b) after UV irradiation).

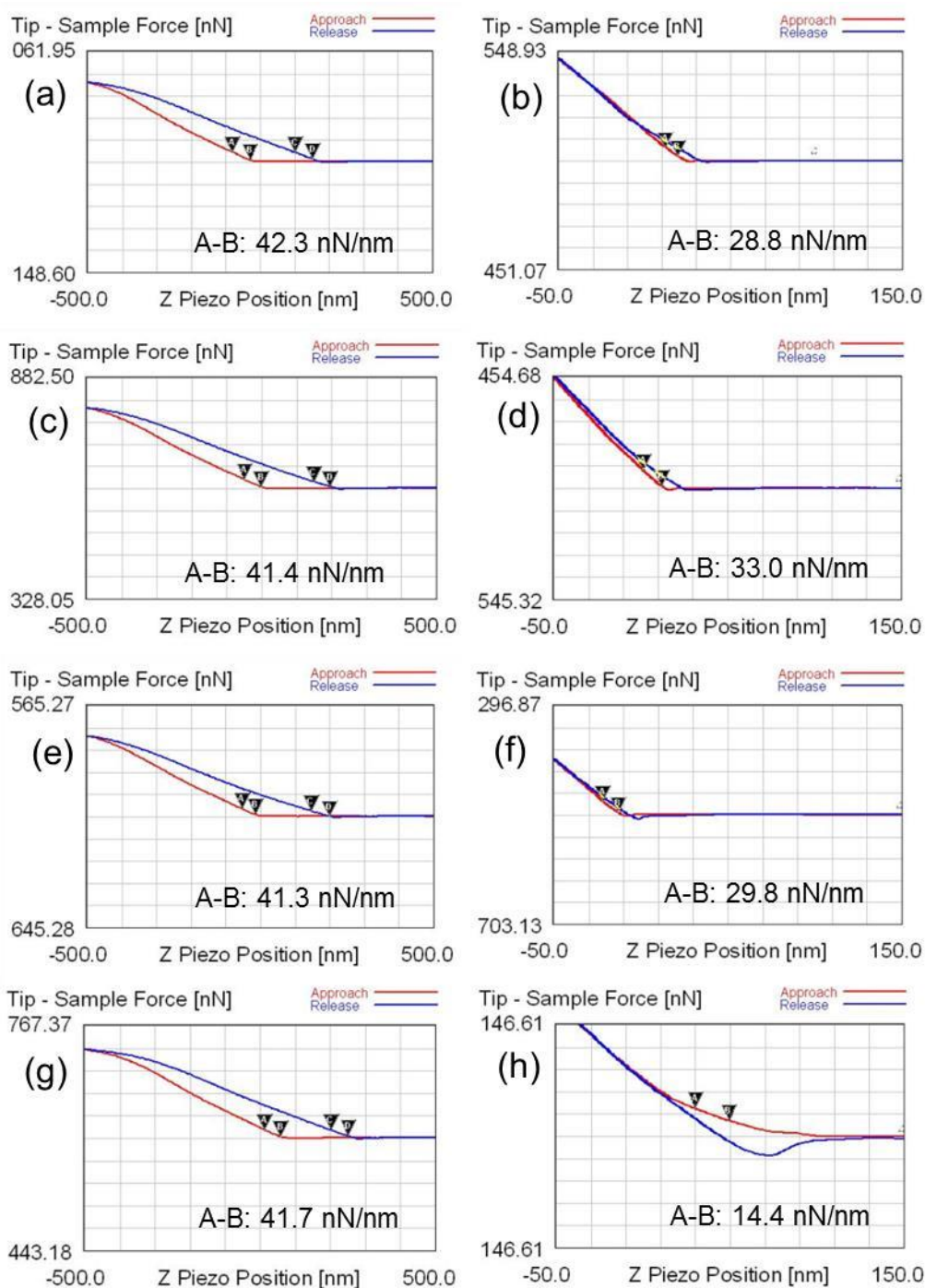


Fig. S6. Summary of the force curves (FC) obtained by SPM on single crystalline surfaces of **4o**. FCs were measured at 23 (a, b), 25 (c, d), 29 (e, f), and 50 °C (g, h). FCs before UV irradiation are shown in Figs. (a), (c), (e), (g), and FCs after UV irradiation are shown in Figs. (b), (d), (f), (h).

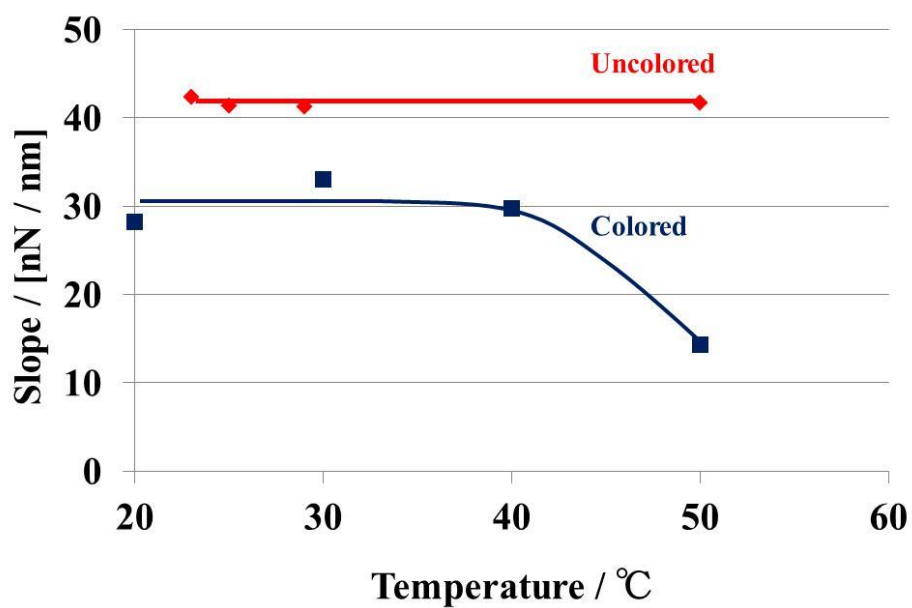


Fig. S7. Relation between temperatures and slope of force curves indicating the hardness of the surface obtained by SPM on single crystalline surfaces of **4o** ((a) before and (b) after UV irradiation).

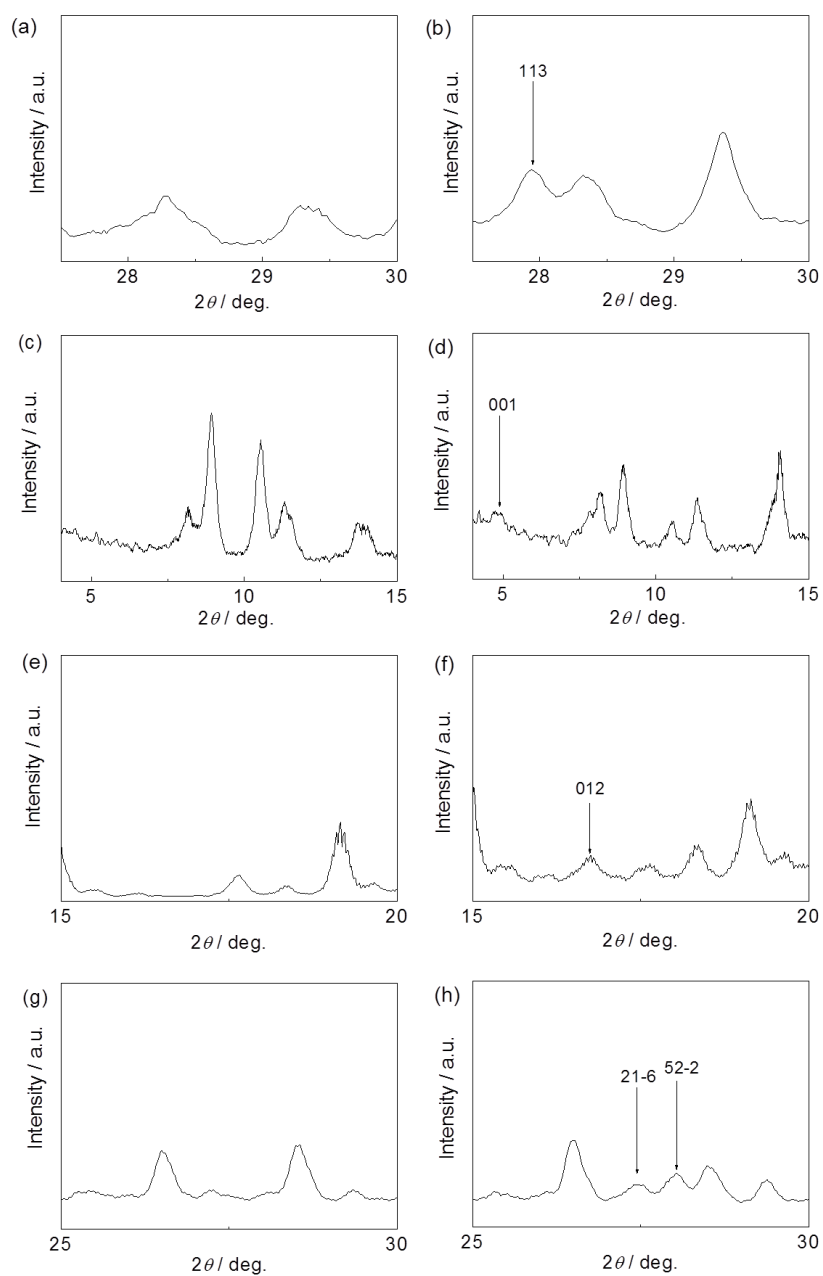


Fig. S8. The XRD patterns of microcrystalline surfaces of **1o**, **2o**, **3o** and **4o** (a, c, e, g), and microcrystalline surfaces storage at eutectic temperatures in the dark after UV irradiation (b, d, f, h). The diffraction peak at 27.9° , attributed to 113 diffraction of **1c** (b), the diffraction peak at 5.00° , attributed to 001 diffraction of **2c** (d), the diffraction peak at 16.7° , attributed to 012 diffraction of **3c** (f), the diffraction peaks at 27.3° and 28.1° , attributed to 21-6 and 52-2 diffractions of **4c** (h) were observed.