

Electronic Supplementary Information (ESI) for

Alignment of photoconductive self-assembled fibers composed of π -conjugated molecules under electric fields

Yoshiko Shoji, Masafumi Yoshio,* Takuma Yasuda, Masahiro Funahashi and Takashi Kato*

*Department of Chemistry and Biotechnology, School of Engineering,
The University of Tokyo, Hongo, Bunkyo-ku, Tokyo 113-8656, Japan*

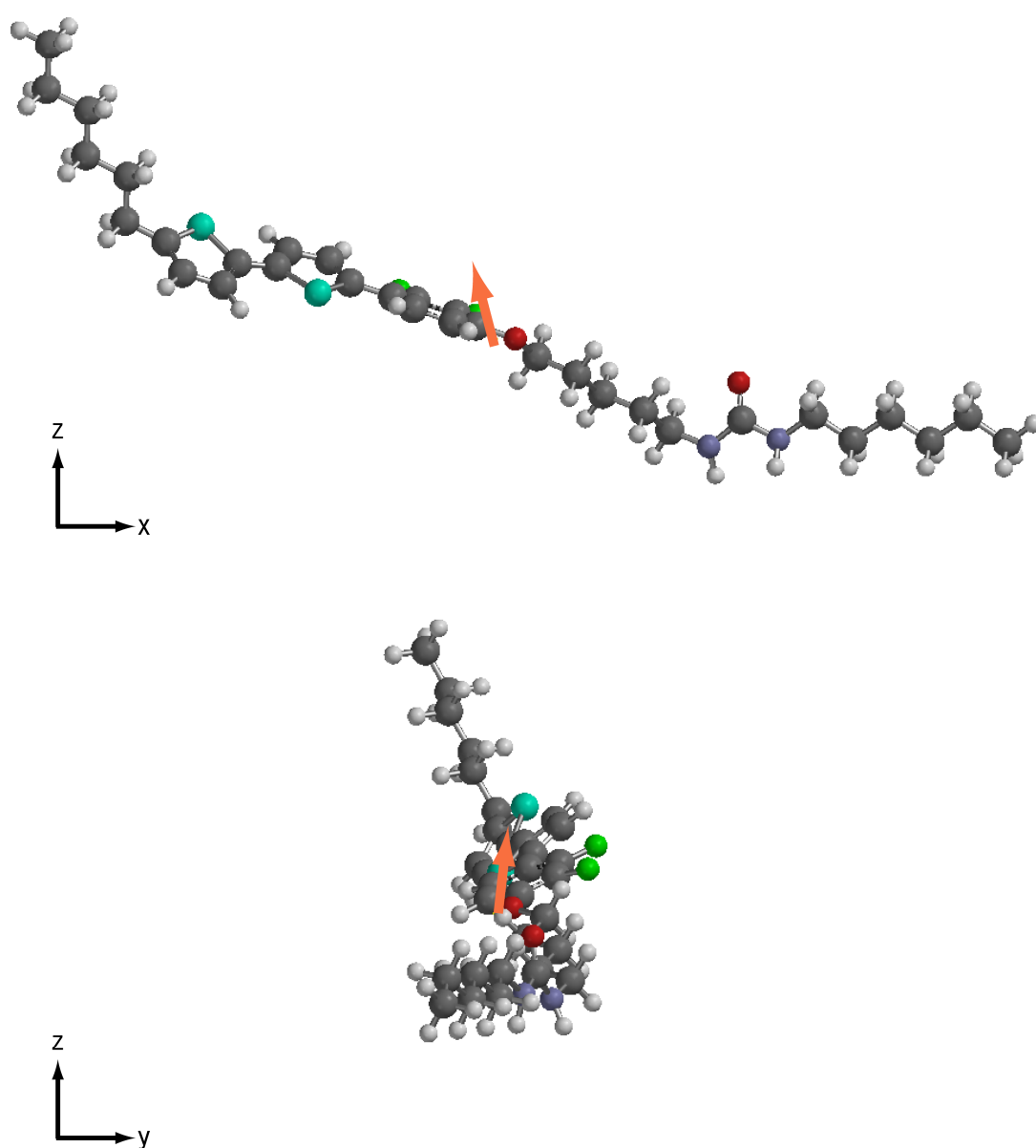


Fig. S1 Molecular model of **1a** calculated at the B3LYP/6-31G* level. The arrows indicate the direction of the dipole moment.

Table S1 Gelation properties of compounds **1a** and **1b** in the concentration of 50 g L⁻¹

Solvent	1a	1b
Hexane	Insoluble	Insoluble
Ethyl acetate	Insoluble	Insoluble
Chloroform	Precipitate	Precipitate
Dichloromethane	Precipitate	Insoluble
Acetone	Insoluble	Insoluble
Methanol	Insoluble	Insoluble
Dodecylbenzene	Gel	Gel
Dodecane	Gel	Gel

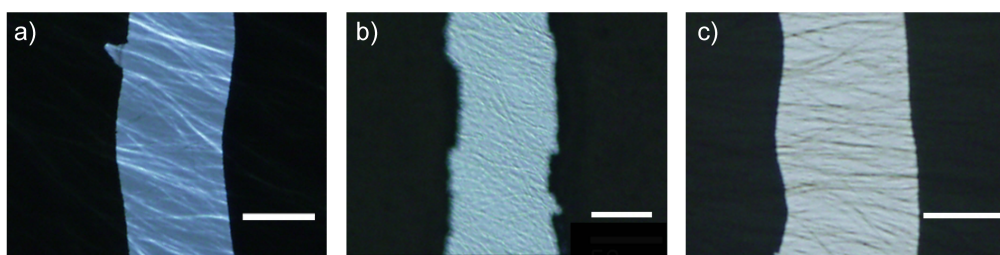


Fig. S2 Optical photomicrographs of self-assembled fibers of **1a** in dodecylbenzene under applying an AC electric field (0.5 V/μm, 1 kHz). The concentration of **1a** in dodecylbenzene : (a) 20 g L⁻¹, (b) 40 g L⁻¹ and (c) 50 g L⁻¹. The scale bar indicates 50 μm.

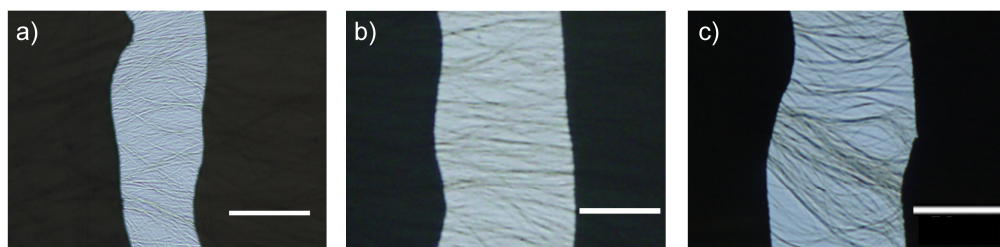


Fig. S3 Optical photomicrographs of self-assembled fibers of **1a** in dodecylbenzene under applying AC electric fields at the frequency of 1 kHz: (a) 0.3 V/μm, (b) 0.5 V/μm, (c) 1.0 V/μm. The scale bar indicates 50 μm.

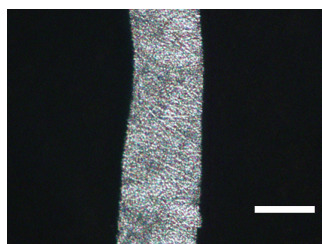


Fig. S4 Optical photomicrograph of self-assembled fibers of **1b** in dodecylbenzene (50 g L^{-1}) under applying an AC electric field ($0.5 \text{ V}/\mu\text{m}$, 1 kHz). The scale bar indicates $50 \mu\text{m}$.

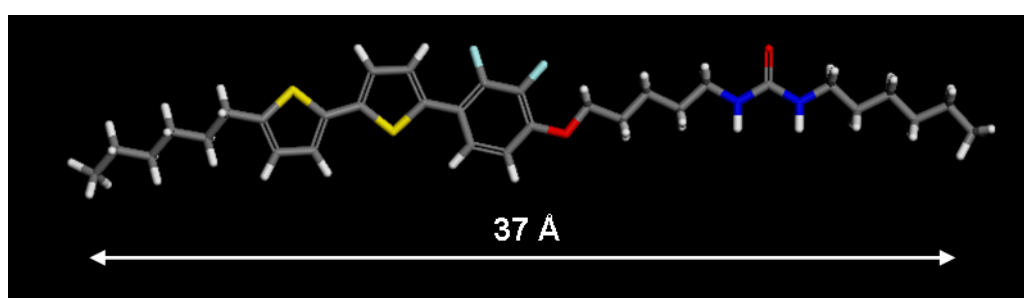


Fig. S5 Energy minimized molecular structure of **1a** with a fully extended conformation.

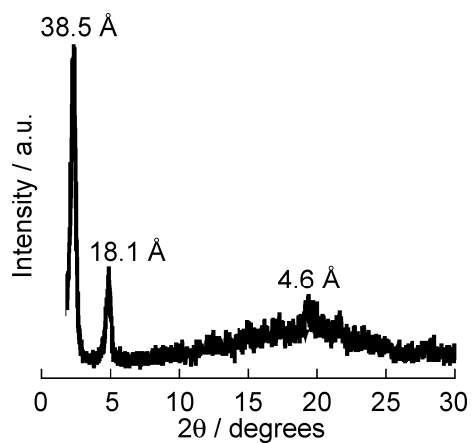


Fig. S6 X-ray diffraction pattern of the xerogel of **1b** at room temperature. The xerogel sample was prepared by immersing the dodecylbenzene gel of **1b** (50 g L^{-1}) in hexane.

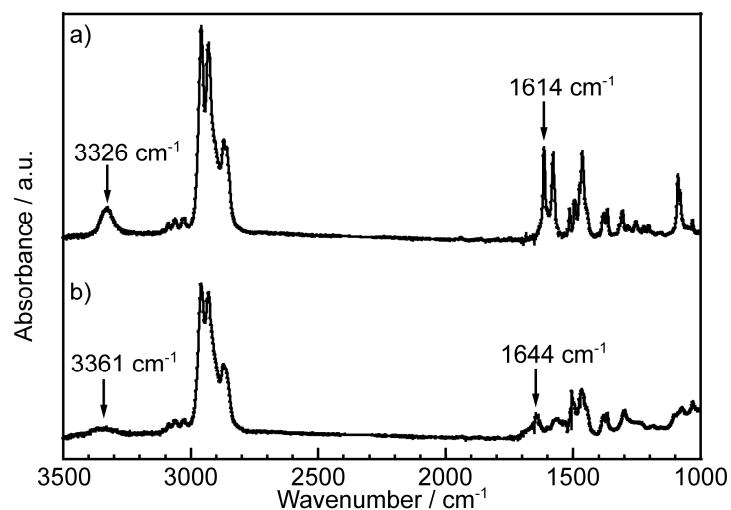


Fig. S7 FT-IR spectra of **1a** in dodecylbenzene (50 g L^{-1}) in the gel state at room temperature (a) and in the sol state at $135 \text{ }^\circ\text{C}$ (b).

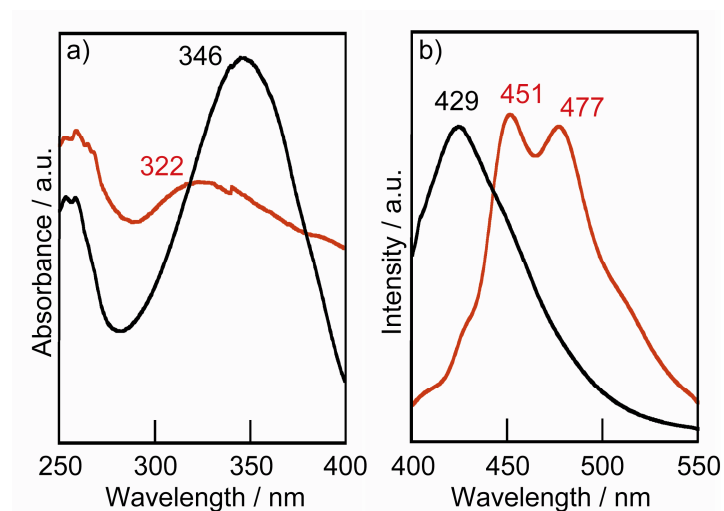


Fig. S8 a) UV-vis absorption and b) fluorescence spectra of the mixture of **1a** and dodecylbenzene (50 g L^{-1}): the gel state at room temperature (red line), and the sol state at $135 \text{ }^\circ\text{C}$ (black line).

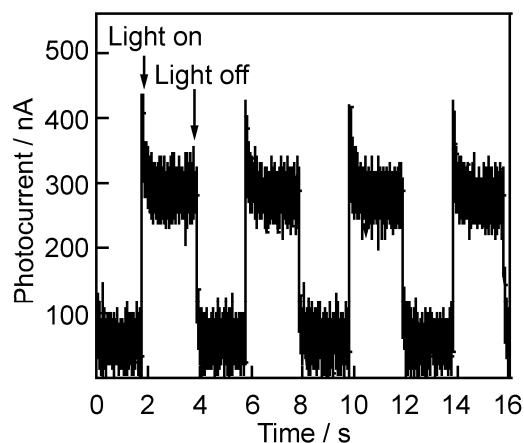


Fig. S9 Photocurrent responses of the randomly entangled fibrous aggregates of **1a** in dodecylbenzene (50 g L^{-1}) at room temperature by the on-off irradiation of ultraviolet light ($\lambda = 365 \text{ nm}$) from a high-pressure mercury lamp.

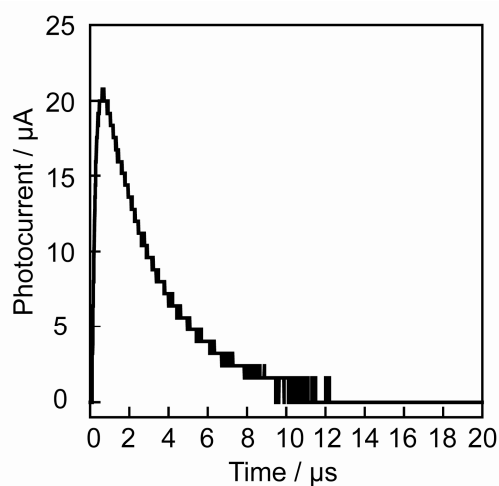


Fig. S10 Transient photocurrent curve of the oriented fibers of **1a** in dodecylbenzene (50 g L^{-1}) at room temperature. The applied electric field is $1 \text{ V}/\mu\text{m}$.