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Supplementary information for

Highly bright and sharp light emission of a single nanoparticle of crystalline rubrene

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This Supporting Information presents the following results:

(1) Scanning electron microscope (SEM) images of rectangular rubrene (R-rubrene) NPs and hexagonal rubrene (H-rubrene) NPs.

(2) Environmental stability of the luminescence characteristics of crystalline H-rubrene NPs.

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(1) SEM images of R- and H-rubrene NPs.

Figs. S1 (a) and (b) show SEM images of the R- and H-rubrene NPs, respectively. The rectangular and hexagonal shapes of the rubrene NPs were clearly observed with diameters of about 175 (±45) and 170 (±40) nm, respectively, as shown in Figs. S1 (a) and (b), respectively.

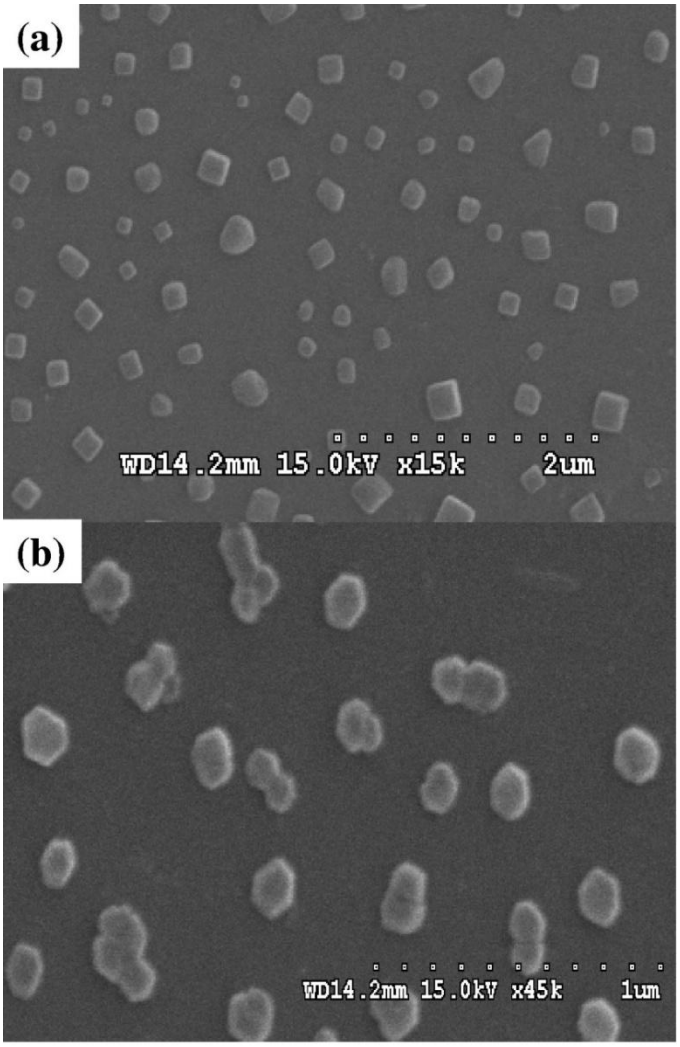

Fig. S1 SEM images of (a) R- and (b) H-rubrene NPs**.**

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(2) Environmental stability of the luminescence characteristics of crystalline rubrene NPs.

For environmental stability of the luminescence characteristics, we measured the LCM PL and color CCD images for the fresh and aged H-rubrene NPs, under the same experimental conditions. [1,2] Figs. S2 (a) and (b) show color CCD and three dimensional (3-D) LCM PL images of the aged H-rubrene NPs, respectively, after three months of exposure to the atmosphere. We consistently observed highly bright light-emission with a yellowish-green color for the H-Rubrene NPs aged three months. The voltages of the LCM PL intensities of the aged H-rubrene NPs were 4.5 ~ 5.9 V, which were similar to those of the fresh H-rubrene NPs. These results imply that the crystalline structure of rubrene NPs protected against signal photo-bleaching, which contributed to the environmental stability of light emission. Crystalline rubrene NPs treated with solvent-vapor annealing are promising organic nanomaterials for optoelectronic devices in terms of bright light emission with long-term stability.[3-4]

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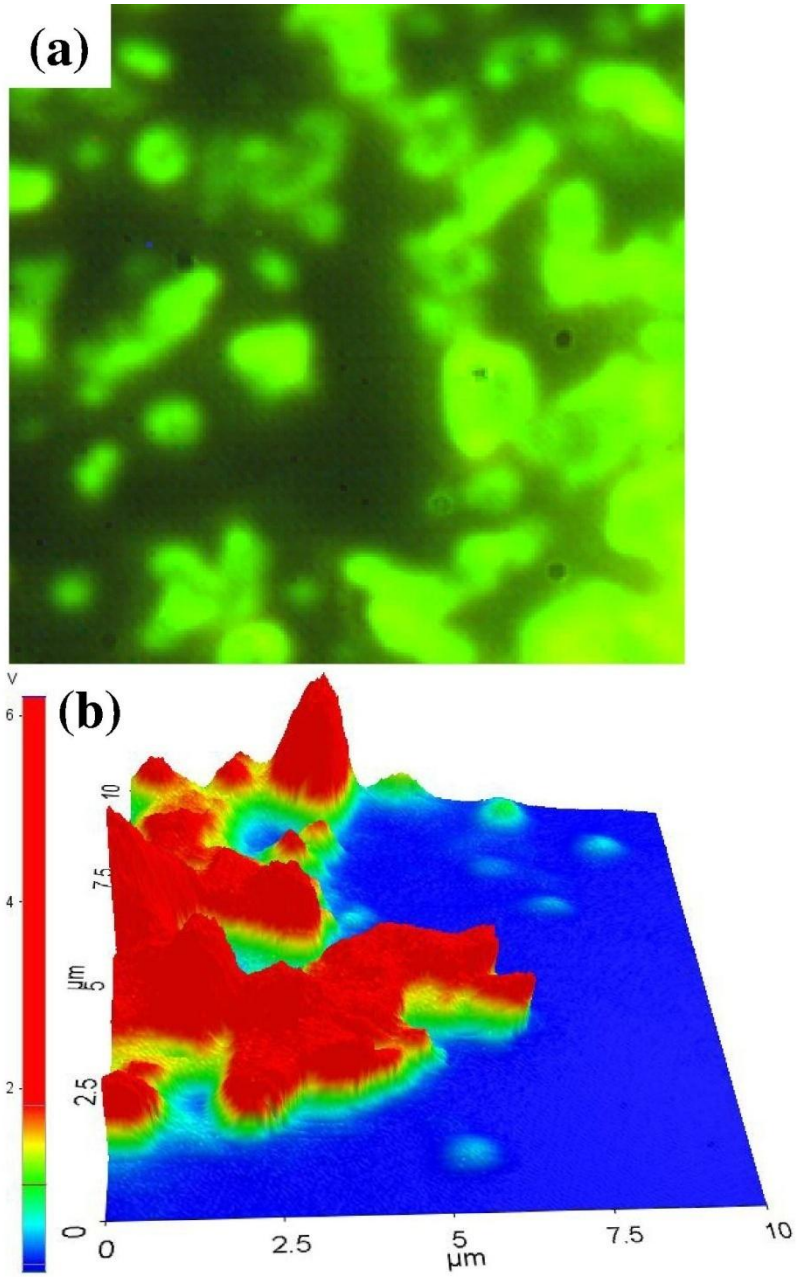

Fig. S2 (a) Color CCD image of the aged (three months) H-rubrene NPs. (b) 3-D LCM PL image of the aged (three months) H-rubrene NPs.

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