Supplementary Material (ESI) for New Journal of Chemistry

Supporting Information

Photoswitching in diarylethene nanoparticles, a trade-off between bulk solid and solution: towards balanced photochromic and fluorescent properties

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1) AFM images without nanoparticles

Figure S1 displays AFM images of an aqueous solution of the SDS surfactant at the same concentration as the suspension of diarylethene nanoparticles. Most of the time, the AFM pictures showed a clean surface without particles (Fig. S1a). The surfactant is located in some restricted area, as a bulky amorphous solid with a size of a few hundreds of nanometers (Fig. S1c). Some rare pictures could show small particles with a size comprised between 10 and 50 nm, like in Fig. S1b. But the density of such objects (small SDS aggregates, dirt...) is always very low. As a comparison, the AFM images measured in the sample made of nanoparticles of **1**, obtained by the laser ablation method, show systematically a quite high density of nanoparticles, as presented in the main text, Fig. 2.

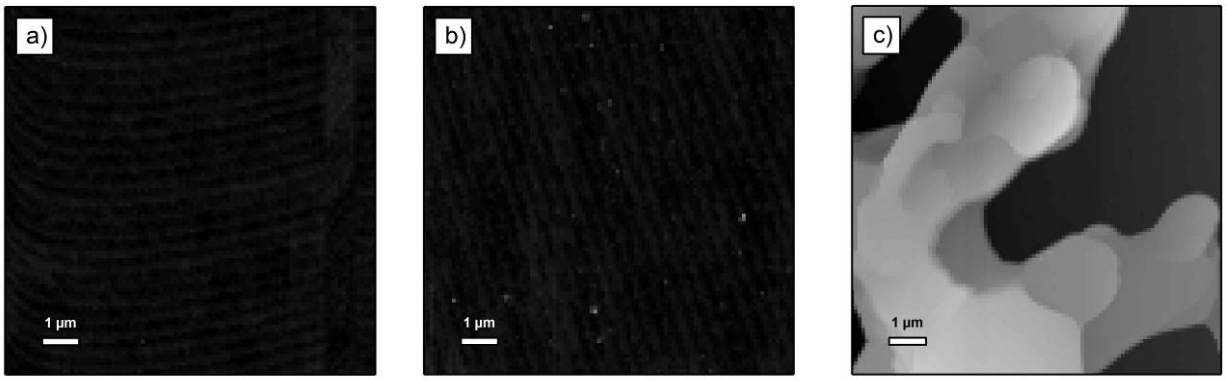

Figure S1. Atomic force microscopy (AFM) images of a water solution containing the surfactant only (SDS, 2.4×10^{-2} M) deposited on a glass substrate. Three typical examples (a, b, and c) were measured at different locations in the sample.

2) Absorption and fluorescence spectra: CH_3CN solution vs nanoparticles

Absorption and fluorescence spectra of **1** in the solution state (CH_3CN) and in the nanoparticles state are displayed in Figure S2. The absorption spectra show similar band maxima, but the general shapes are not equivalent (band ratio, width...). The normalized fluorescence spectra are definitely different: λ_{max} = 475 nm in colloidal suspension of nanoparticles in water, whereas λ_{max} = 500-505 nm in CH_3CN solution.

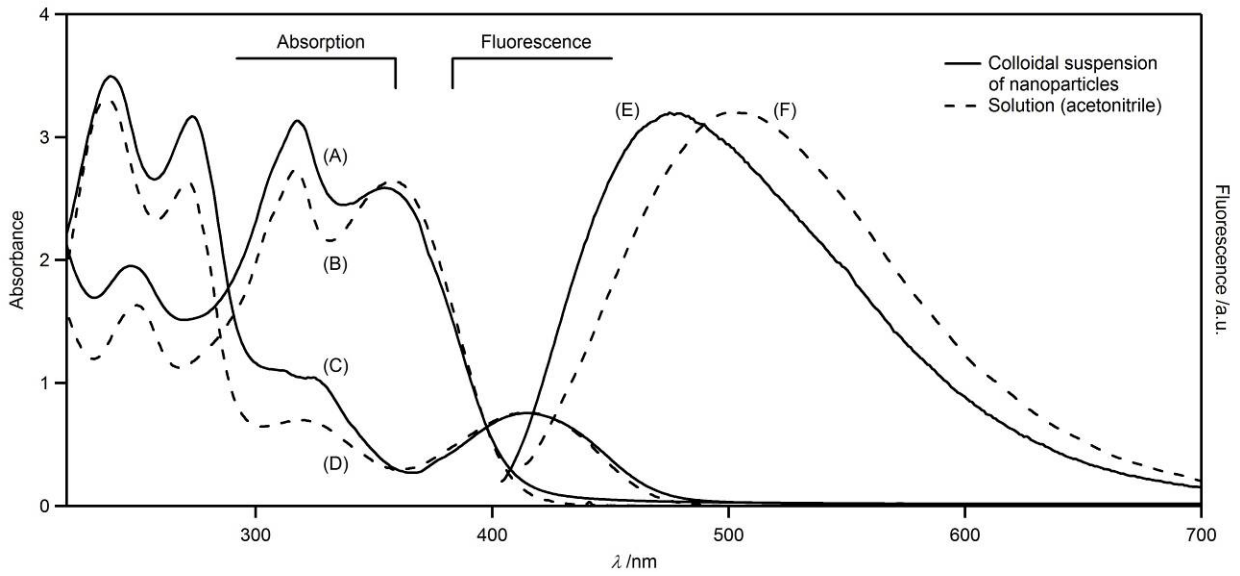

Figure S2. Absorption and fluorescence spectra of **1** in CH_3CN solution (broken lines) and as nanoparticles in colloidal suspension (full lines): absorption spectra of (A, B) **1**-OF and (C, D) **1**-CF, and (E, F) fluorescence spectra of **1**-OF.