Electronic Supplementary Material

Architectural Transformation of the Nanoparticles Superstructures Induced by Ultraviolet Light Irradiation and Their Application in Photoelectrochemical Switch Devices

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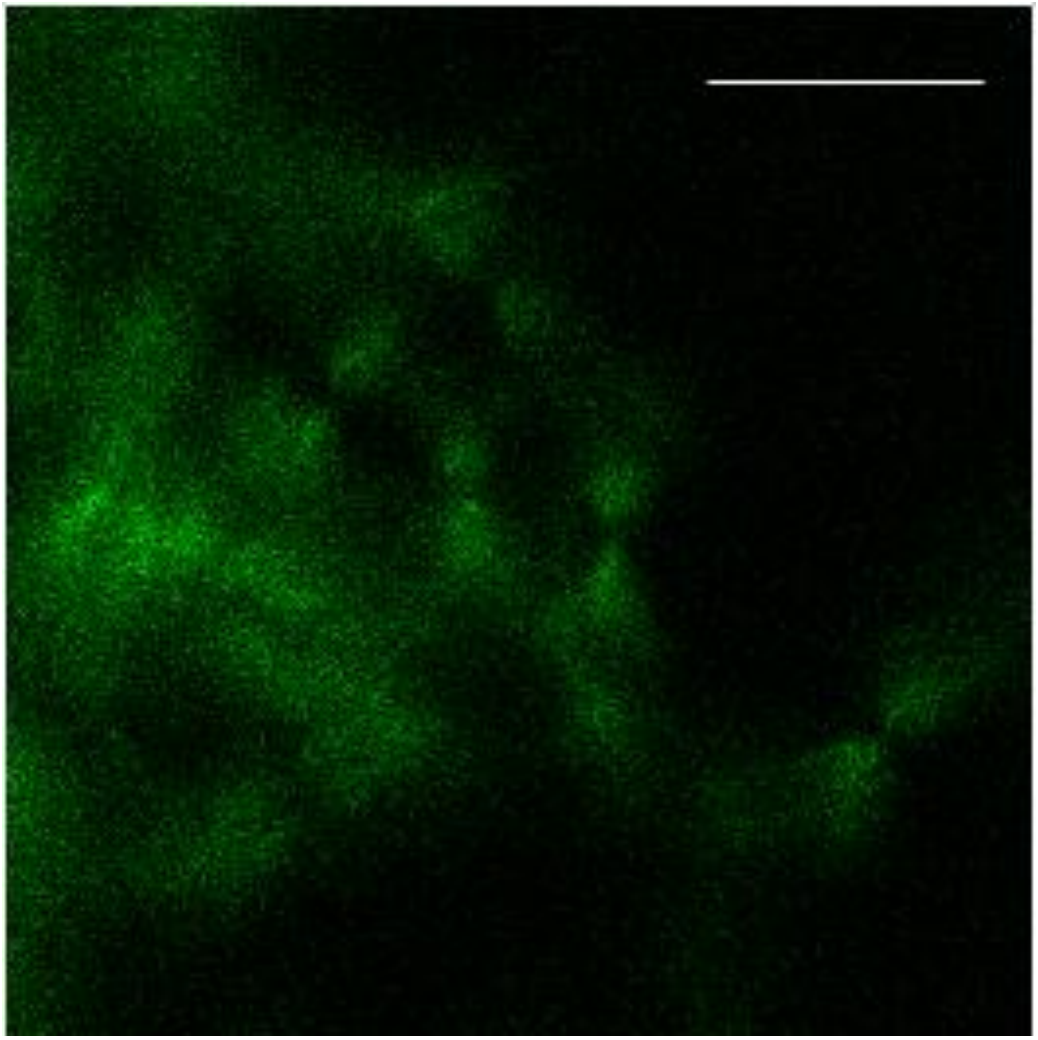


Figure S1. A large size laser confocal fluorescence microscopy image of bowknot-shaped structures. Scale bar: 10 μm.

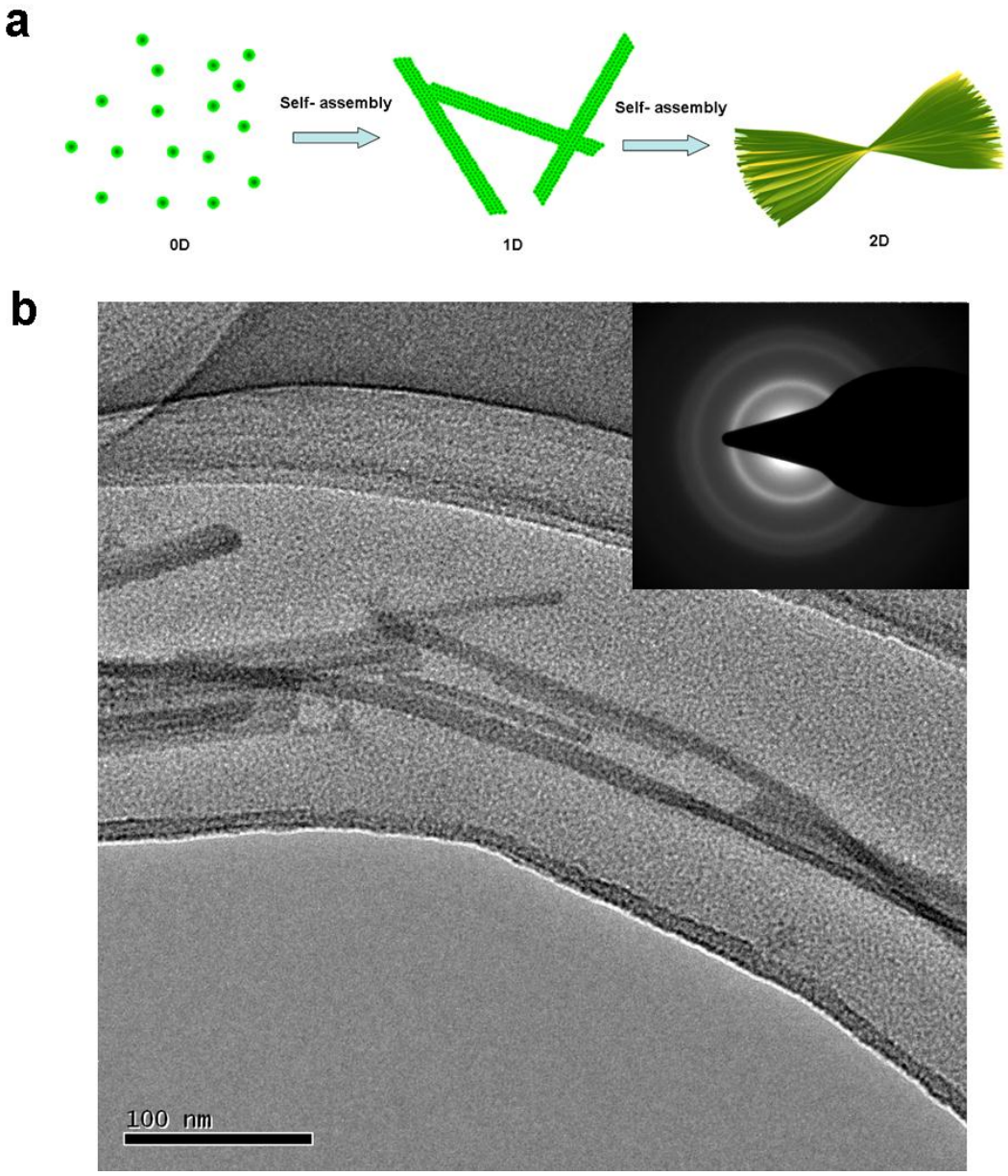


Figure S2. (a) A schematic representation of the NPs selfassembling route from NPs to 2D structure. (b) a TEM image of 1D NPs superstructures. The inset of image (b) is the SAED patterns from CdS NPs with diffraction rings characterizing.

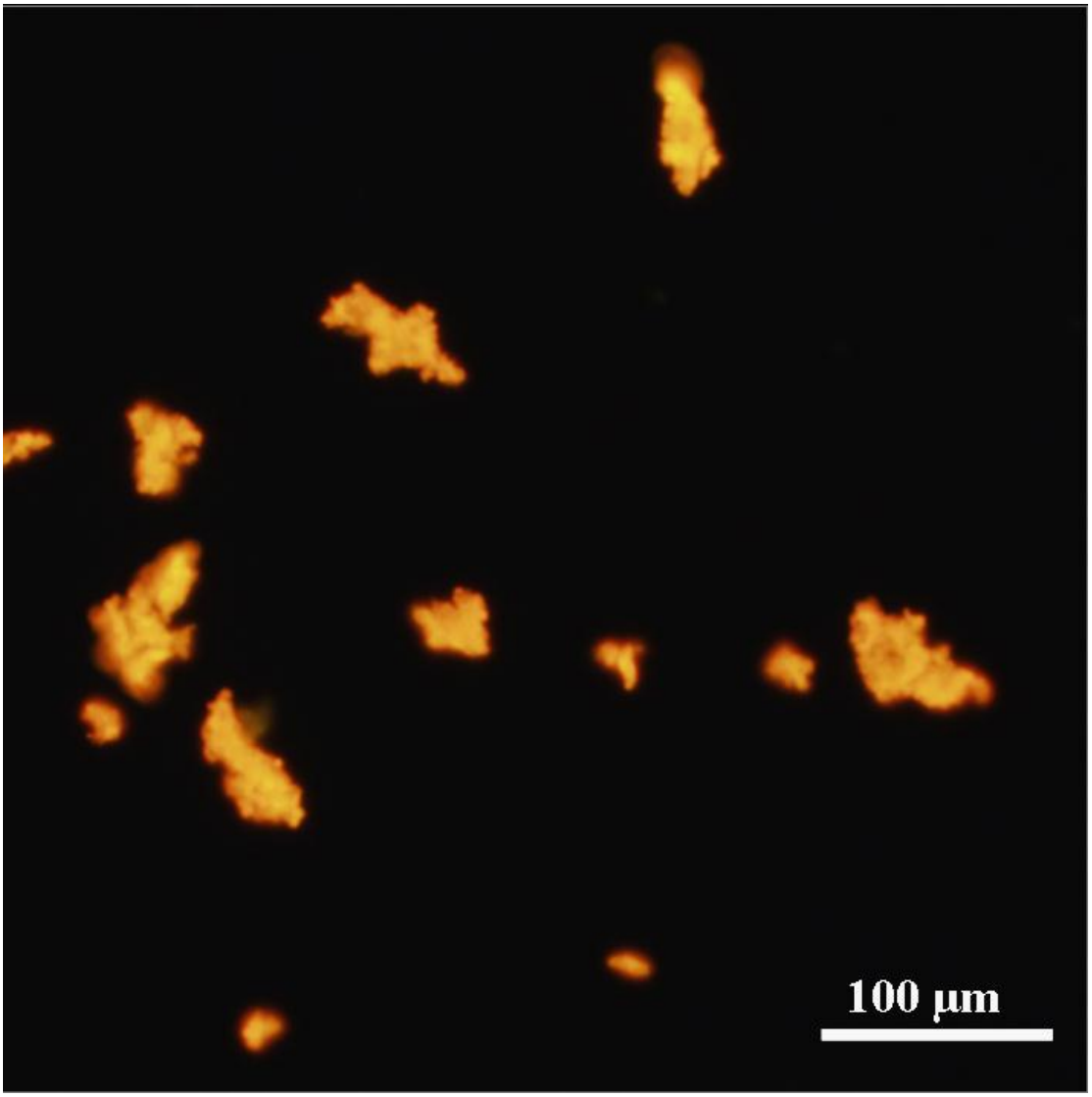
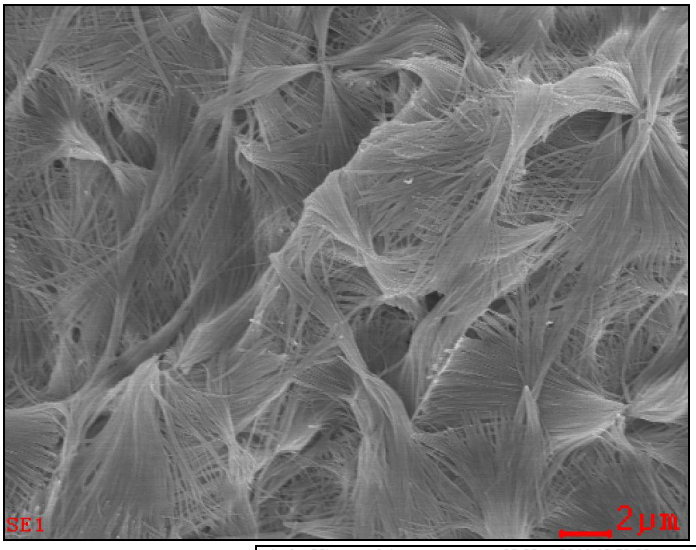


Figure S3. A fluorescence microscopy image of double-flower-shaped NPs superstructures. We can observe the orange fluorescence.



Element	*Wt%*	*At%*
SK	21.01	48.27
CdL	78.66	51.54
TeL	00.33	00.19
Matrix	Correction	ZAF

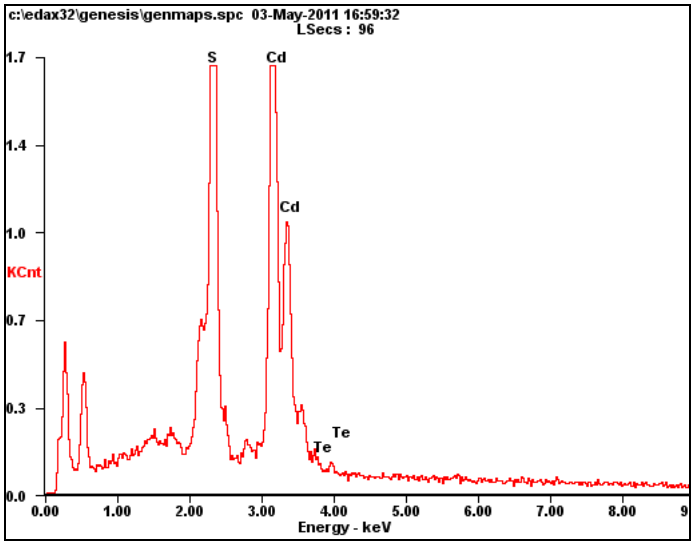
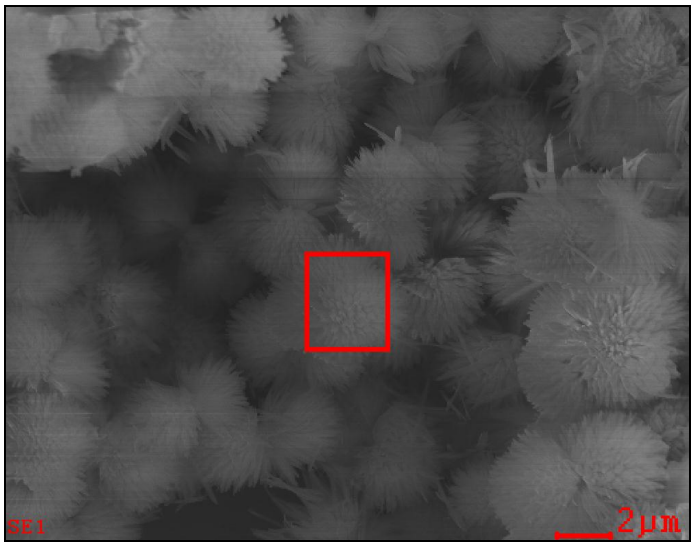


Figure S4. energy dispersive spectroscopy (EDS) results of bowknot-shaped structures.



Element	*Wt%*	*At%*
SK	20.42	47.40
CdL	78.13	51.75
TeL	01.46	00.85
Matrix	Correction	ZAF

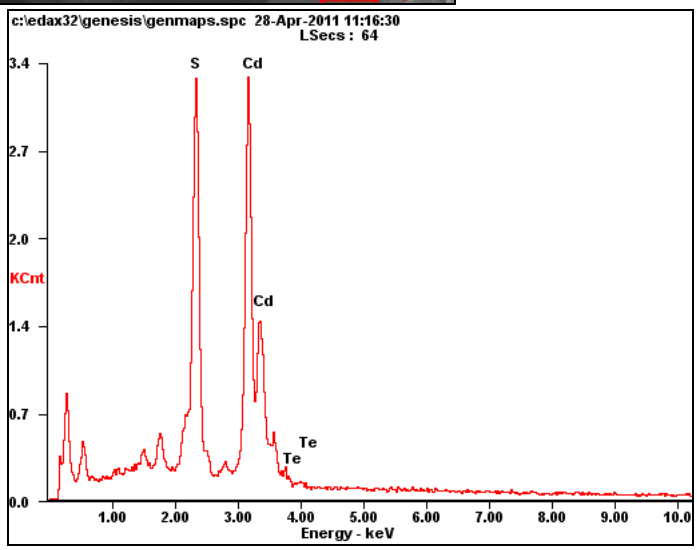


Figure S5. Energy dispersive spectroscopy (EDS) results of double-flower-shaped structures.

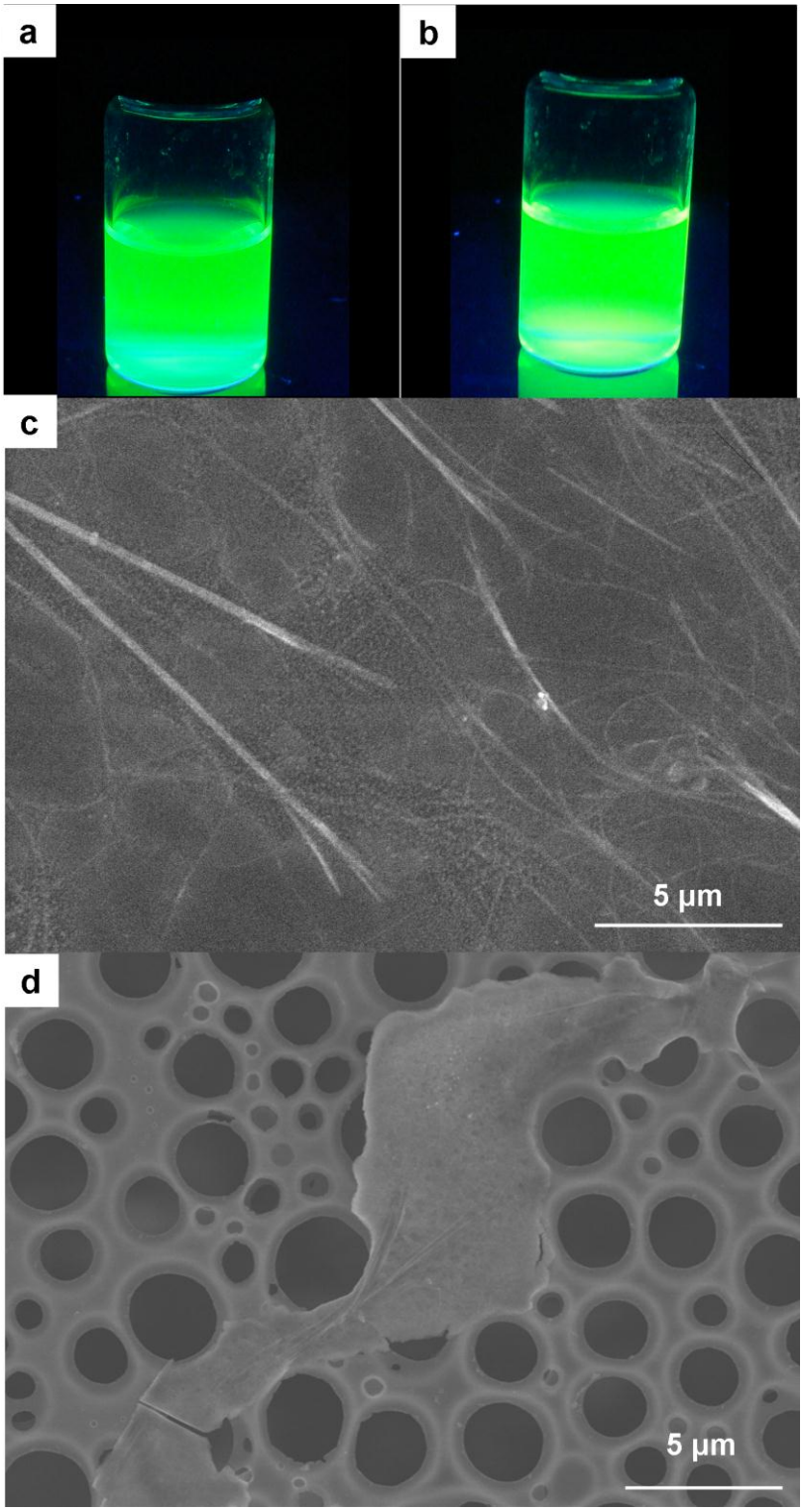


Figure S6. The results of ribbon bunches structure. (a) The photograph of unirradiated ribbon bunches self-assemblies. (b) The photograph of irradiated ribbon bunches self-assemblies for 30 minutes. (c) SEM images of unirradiated ribbon bunches. (d) SEM images of irradiated ribbon bunches.

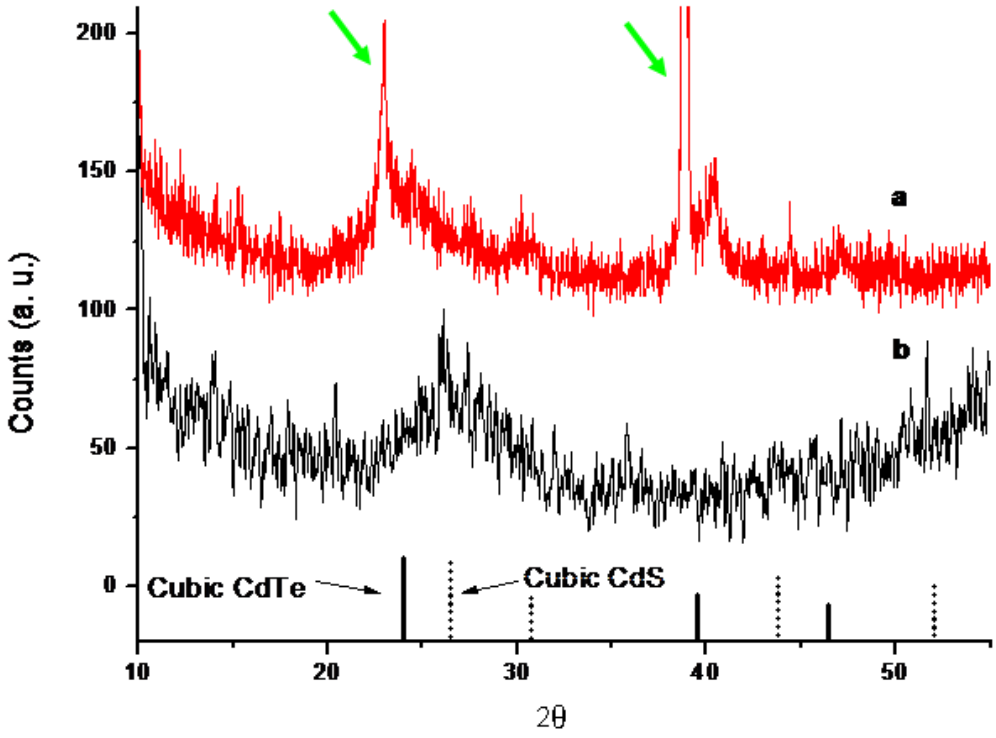


Figure S7. XRD patterns of TGA-capped (CdS)/CdTe nanoparticles superstructures recorded before irradiated (a), and after irradiated (b). The standard diffraction lines of cubic CdTe and cubic CdS are also shown at bottom.

X-Ray diffraction (XRD) samples (the bowknot-shaped and double-flowers-shaped nanoparticles superstructures) were prepared by depositing the superstructures on a Rotundity Zero-background Sample Holder. Figure S7 shows the X-ray diffraction patterns of (CdS)/CdTe capped with TGA before and after irradiated in comparison with standard diffraction lines for cubic CdTe and CdS, respectively. Because of NaOH in sample, the huge peaks 23.1° and 38.8°,[1-2] were pointed out by two green arrows, were attributed to sodium hydroxide. Before irradiated, superstructures exhibit diffractions quite neither close to peaks of bulk cubic CdTe nor to that of cubic CdS. The results are attributed to the S element instead of Te element in NPs superstructures.[3] After irradiated for 30 minutes, the diffraction pattern of superstructures obtained move toward higher angles. (The double-flowers-shaped nanoparticles superstructures had been precipitated in solution due to irradiation, so we can not identify the NaOH in samples.) The strongest peak corresponded to cubic CdS (111), which were comparable with standard lattice

parameters.[4] But the diffraction peaks of (220) (311) were broaden and too weak to observe, which can be attribute to the photocorrsssion.

Thank you very much.

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2. Jacobs, H. et al Z. Anorg. Allg. Chem. 531, 119(1985). JCPDS file no. 78-0189

3. Bao, H. B. et al Chem. Mater. 16, 3853(2004).

4. Yeh, C. et al Phys. Rev. B 46. 10086(1992). JCPDS file no. 80-0019