

Supporting information for:

Synthesis and characterization of axial heterojunction inorganic/organic semiconductor nanowire arrays†

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Supporting Figures

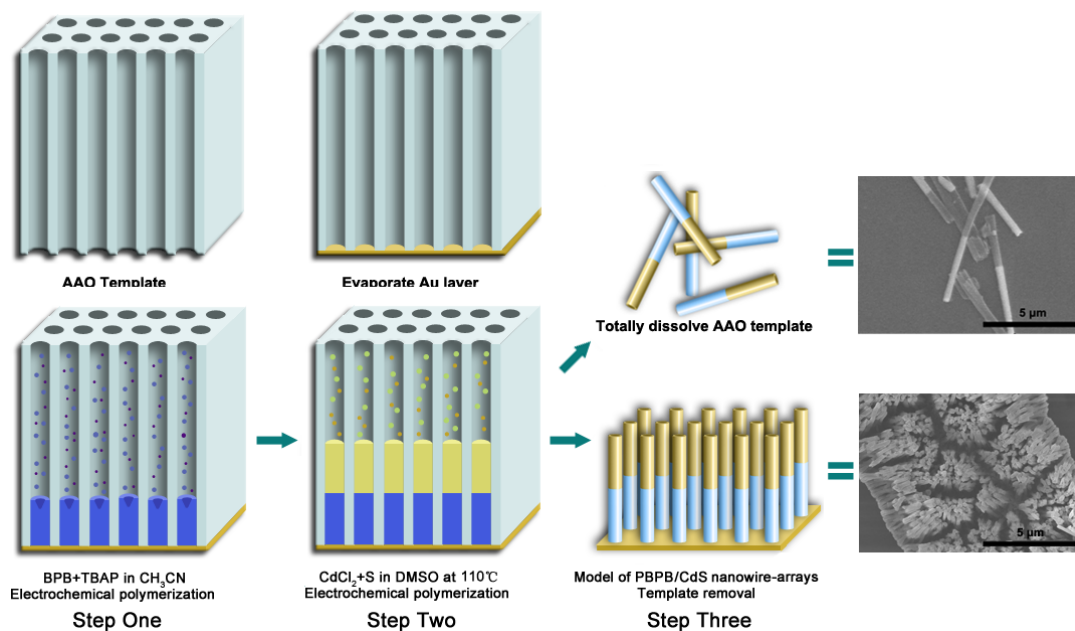


Figure S1. The detailed synthesis procedure of PBPB/CdS heterojunction nanowire arrays

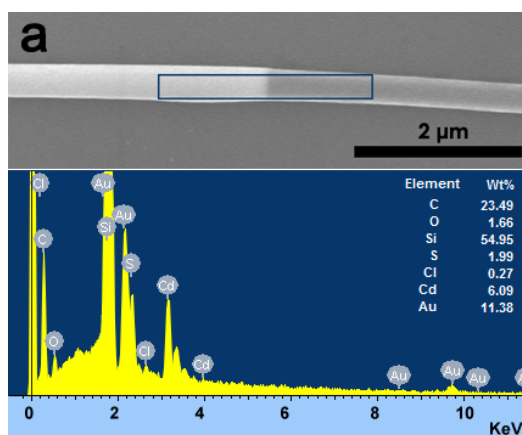


Figure S2. Energy-dispersive X-microanalysis (EDS) of PBPB/CdS heterojunction nanowire on silicon substrates (a), the nanowire was coated with gold. The analysis of EDS was shown that there were C (Wt%, 23.49), O (1.66), S (1.99), Cl (0.27) and Cd (6.09) in the PBPB/CdS nanowire.

From the Figure S2a (the linear scanning) we can conclude that the left half of the PBPB/CdS nanowire was constituted of PBPB, and the other half was CdS. While the EDS of the PBPB/CdS nanowire was also done to identify the elements in the nanowire.

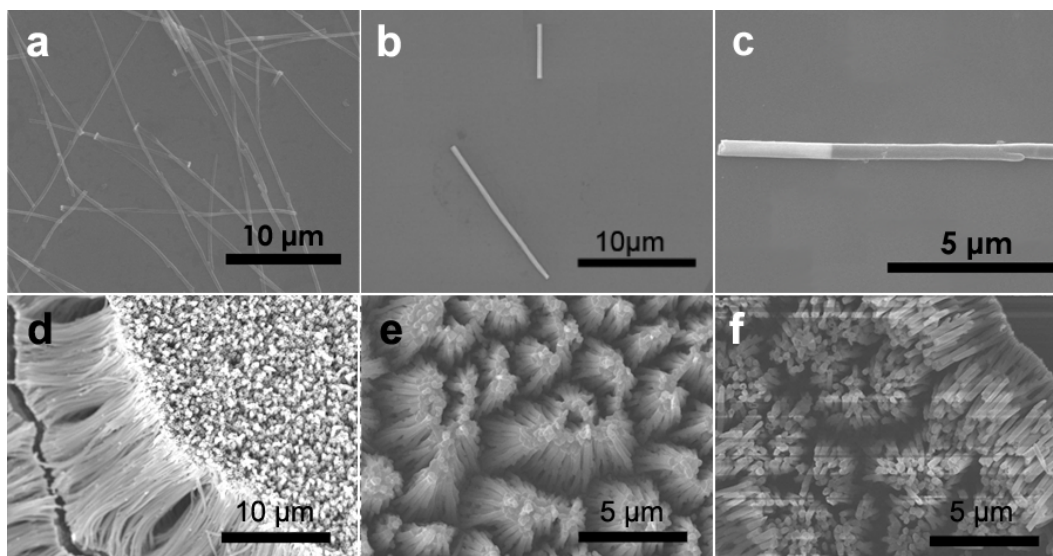


Figure S3. SEM image of individual PBPB nanowires (a) and nanowire arrays (d); SEM image of individual CdS nanowires (b) and nanowire arrays (e); SEM image of PBPB/CdS heterojunction nanowire (c) and nanowire arrays (f).

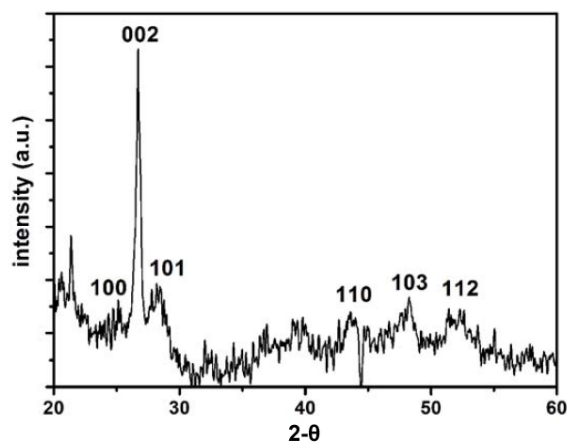


Figure S4 X-ray diffraction patterns (XRD) of the heterojunction nanowires

The XRD patterns for the heterojunction nanowires are shown in **Figure S4**. All of the peaks can be assigned to [100], [002], [101], [110], [103] and [112] planes of wurtzite structure CdS. It is found that the [002] peak of wurtzite CdS is the dominant in XRD patterns. This information corresponding to the conclusion of HRTEM indicates that the nanowire is composed by the wurtzite structure CdS, which mainly grows along [100] direction.

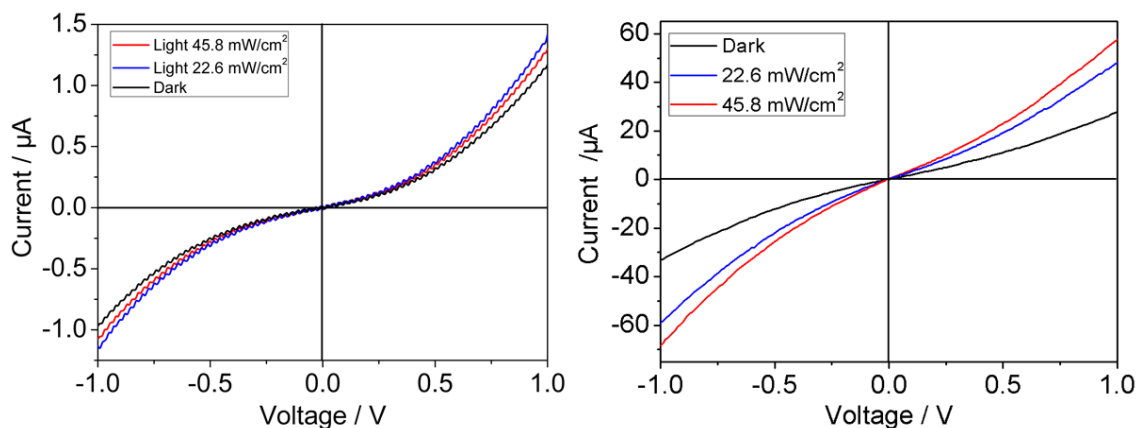


Figure S5. Typical I - V curves of PBPB nanowire arrays in dark and under illumination (22.6 mW/cm^2 and 45.8 mW/cm^2) (a); Typical I - V curves of CdS nanowire arrays in dark and under illumination (22.6 mW/cm^2 and 45.8 mW/cm^2) (b).

From the **Figure S5** we can calculate the conductivity of PBPB and CdS nanowire arrays, the conductivity of PBPB nanowire arrays was about 1×10^{-4} S/cm under different illumination intensity; and the conductivity of CdS nanowire arrays was 2.6×10^{-4} S/cm in the dark, 5.0×10^{-4} S/cm under 22.6 mW/cm^2 and 6.7×10^{-4} S/cm under 45.8 mW/cm^2 , respectively.

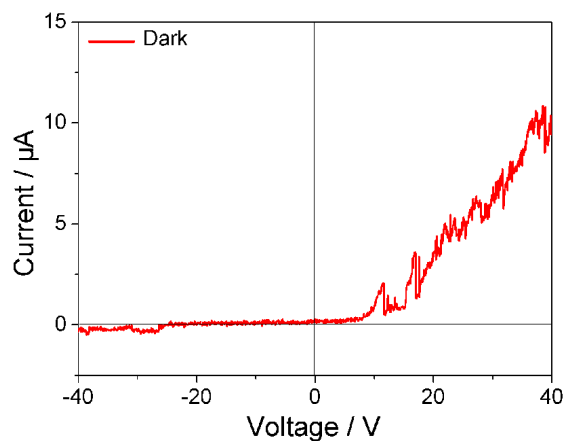


Figure S6. Typical I - V curves of PBPB/CdS heterojunction nanowire in dark.