Supporting Information For
Constructing a Blue Light Photodetector on Inorganic/Organic p-n Heterojunction Nanowire Arrays

Figure S1. Schematic illustration of the synthesis procedure of PANI/CdS heterojunction nanowire arrays.

Figure S2. SEM images of individual nanowires: (A) PANI nanowire; (B) CdS nanowire; (C) PANI/CdS heterojunction nanowire. SEM images of nanowire arrays: (D) PANI nanowire arrays; (E) CdS nanowire arrays; (F) PANI/CdS heterojunction nanowire arrays.
Figure S3. (A) Element mapping of a single PANI/CdS heterojunction nanowire; (B) Linear scanning of a single PANI/CdS heterojunction nanowire; (C) Energy-dispersive X-microanalysis spectrum (EDS) patterns of the PANI/CdS heterojunction nanowire on silicon substrate.

We directly demonstrated the end-to-end structure of an as-prepared PANI/CdS heterojunction nanowire by the element map scanning (Figure S3A) and the linear scanning (Figure S3B), which show the dispersion of C element, Cd element and S element clearly. The energy-dispersive X-microanalysis spectrum (EDS) patterns (Figure S3C) collected from the heterojunction nanowire clearly display the detailed chemical components. These results indicated that the heterojunction nanowire was indeed composed of PANI and CdS.

Figure S4. Spectral response of PANI/CdS heterojunction nanowire array device.
**Figure S5.** (A) Typical $I$-$V$ curves of PANI nanowire arrays in dark and under white light illumination; (B) Typical $I$-$V$ curves of CdS nanowire arrays in dark and under white light illumination.

**Figure S6.** Energy level diagram of PANI/CdS heterojunction nanowire array device.