Supporting Information for

Memory applications and electrical bistability of semiconducting nanoparticles: do the phenomena depend on bandgap?

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Figure S1. Powder X-ray diffraction pattern of different semiconducting nanocrystals.
**Figure S2.** Selected Area Electron Diffraction (SAED) patterns of different nanocrystals. The corresponding lattice planes of the nanoparticles are shown in the figures.
**Figure S3.** EDX analyses of the different nanoparticles.
**Figure S4.** Growth of LbL films of CdS nanoparticles. Absorption spectrum of LbL films of different number of layers is shown in the figure. Inset shows absorbance at 405 nm as a function of number of layers.

**Figure S5.** *I-V* characteristics under three voltage loops on the monolayer of CdS, CdSe, PbS, and PbSe nanoparticles. Direction of voltage (as shown by arrows in one of the figures) was 0 to +1.0 to –1.0 to +1.0 V and so on.
Figure S6. I-V characteristics at three different points on the monolayer of CdS, CdSe, PbS, and PbSe nanoparticles in a voltage loop. Direction of voltage (as shown by arrows in one of the figures) was 0 to +1.0 to −1.0 to +1.0 V.
Figure S7. $I$-$V$ characteristics of CdS, CdSe, PbS, and PbSe monolayers with STM tip as the other electrode. For each of the cases, results are presented from (i) pristine film, (ii) after application of a $+6.0$ V pulse (10 ms), and (iii) after application of a $-6.0$ V pulse (10 ms). $I$-$V$ characteristics after application of a positive and a negative voltage pulse have been repeated in three cycles. While the characteristics of a pristine film are shown in black, those after positive and negative voltage pulses are designated as broken and continuous color lines.
Figure S8. RAM applications. Voltage sequence and corresponding current in a monolayer of CdSe are shown. “Write”, “erase” and “read” voltage pulses have amplitude of +1.0 V (5 s), -1.0 V (5 s), and -0.3 V (2 s), respectively. Read pulses, which had a duty cycle of 50 %, never added up to the “write” process. Broken lines represent the current level of the high- and the low-states under “read” voltage.