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Nanowire Transistors, Gate Electrodes, and Their Directed Self-Assembly K. SKINNER, Applied and Materials Sciences, UNC-CH, Chapel Hill, NC, R.L. CARROLL, Physics & Astronomy, UNC-CH, Chapel Hill, NC, SEAN WASHBURN, Applied and Materials Sciences, UNC-CH, Chapel Hill, NC, C. DWYER, Computer Science, Duke Unversity, Durham, NC — Lithographic processes used in the fabrication of current CMOS technology for microprocessors are rapidly approaching both fundamental and practical limitations. Nanowires capable of acting as either transistors or interconnects are one set of resources currently undergoing heavy research as a possible alternative for lithographic limitations. We present a method for the fabrication of multi-material, segmented nanowires composed of Au and CdSe that display non-linear current-voltage characteristics, and the selective functionalization of these nanowires with DNA by first blocking the Au sites we wish to be non-reactive with 6-mercapto 1-hexanol. Single material, conductive nanowires were then selectively functionalized at only the ends with complementary strands of DNA and were directed to self-assemble with the bound DNA on the segmented nanowires to serve as gate electrodes for the transistors.

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