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CoZnO diluted magnetic semiconductor nanowires HAO ZHOU, SONG HAN, TAO TANG, DAIHUA ZHANG, ZUQIN LIU, CHONGWU ZHOU[1], University of Southern California — We have synthesized a family of cobalt-doped ZnO nanowires using pulsed laser deposition technique, with single-crystalline ZnO nanowires synthesized following the vapor-liquid-solid approach and used as templates. These nanowires are typically 5- 10 micrometers in length and tens of nanometers in diameter. X-ray diffraction was employed to confirm that the doped cobalt atoms replaced the zinc atoms and the lattice constant decreased with increasing cobalt concentration. Electronic transport measurements were performed with individual CoZnO nanowire devices under various magnetic fields and temperatures, and revealed clear semiconductive and magnetic properties. Our experiment opens a new window in the synthesis of low dimensional diluted magnetic semiconductor materials.

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