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# Epitaxial growth and characterization of zinc-blende CrAs/GaAs/MnAs/GaAs multilayers

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The successful synthesis of half-metallic zinc-blende CrAs in a thin film opens a new way to search for novel spintronic materials. [1] Nevertheless, the very thin critical thickness (3 nm) of zinc-blende CrAs film is one of the biggest challenges faced in advancing this material toward applications. Recently, *ab initio* calculations indicated the half-metallic properties are preserved in zinc-blende ferromagentic-semiconductor hybrid multilayers. [2] Experimentally, zinc-blende CrAs/GaAs multilayers up to 20 nm have been successful grown by molecular-beam epitaxy. [3] Here, we report a detailed study of the growth, structural and transport properties of zinc-blende CrAs/GaAs/MnAs/GaAs multilayers on GaAs(001) substrates. The structural properties were examined by reflection high-energy electron diffraction and cross-sectional transmission electron microscopy. We found that the growth temperature and the thickness of MnAs layer are very important to realize zinc-blende mulilayers. Transport measurements were carried out in Hall-bars fabricated by photolithography and wet etching. It was found that all the as-grown samples showed *p*-type conductivity. The resistivity decreased in samples after low temperature annealing.

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