Growth and characterization of a diluted magnetic semiconductor: Gallium Manganese Arsenide (GaMnAs).

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✔ Verified Book of Growth and characterization of a diluted magnetic semiconductor: Gallium Manganese Arsenide (GaMnAs).

Summary:

Semiconductor physics and magnetism are two diverse fields in the domain of physics. A significant amount of research and subsequent progress has been made in these fields. The advancement made in the understanding the underlying physics has enabled the development of several interesting applications. In these applications, semiconductors like Silicon, Gallium Arsenide exploit the charge of the electron and ferromagnetic materials make use of the spin of an electron. If these two interesting properties of semiconductors and ferromagnets can be used in conjunction, several exciting applications can be envisaged.;This new domain where such materials are being researched has been termed as Diluted Magnetic Semiconductors (DMS). The biggest challenge in the development of these materials was to put the idea into practical reality. The invention of a novel low-temperature epitaxial process in the late 1980's enabled the realization of the DMS concept and ushered a renewed interest throughout the scientific community.;Gallium Manganese Arsenide has been a test bed for understanding the underlying science behind DMS. A major challenge in the practical utility of DMS materials has been the very low Curie temperatures. The present thesis work discusses the experiments conducted at the Nanofabrication facility and the magneto-transport laboratory at the University of Arkansas. GaMnAs samples were grown using the LT-MBE process, and the samples were characterized using X-Ray analysis. A deeper insight into the magnetic and transport properties of these materials was acquired through low temperature SQUID and Hall Effect measurements.

Growth And Characterization Of A
Growth And Characterization Of Adp Crystals
Growth And Characterization Of Succinic Acid Single Crystals
Growth And Characterization Of Edta Assisted Cbd-cds
Crystal Growth And Characterization Of The Pyrochlore Tb2ti2o7
Single-crystal Growth And Characterization Of Cu2o And Cuo