

Abstract Submitted
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Investigation of Room temperature Ferromagnetism in Mn doped Ge¹ LEYLA COLAKEROL ARSLAN, BURCU TOYDEMIR, AYKUT CAN ONEL, MERVE ERTAS, Gebze Inst of Tech, HATICE DOGANAY, Res Ctr Julich, Peter Grunberg Inst PGI Elect Properties 6, D-52425 Julich, Germany, GEBZE INST OF TECH COLLABORATION, RESEARCH CENTER JULICH COLLABORATION — We present a systematic investigation of structural, magnetic and electronic properties of Mn_xGe_{1-x} single crystals. Mn_xGe_{1-x} films were grown by sequential deposition of Ge and Mn by molecular-beam epitaxy at low substrate temperatures in order to avoid precipitation of ferromagnetic Ge-Mn intermetallic compounds. Reflected high energy electron diffraction and x-ray diffraction observations revealed that films are epitaxially grown on Si (001) substrates from the initial stage without any other phase formation. Magnetic measurements carried out using a physical property measurement system showed that all samples exhibited ferromagnetism at room temperature. Electron spin resonance indicates the presence of magnetically ordered localized spins of divalent Mn ions. X-ray absorption measurements at the Mn L-edge confirm significant substitutional doping of Mn into Ge-sites. The ferromagnetism was mainly induced by Mn substitution for Ge site, and indirect exchange interaction of these magnetic ions with the intrinsic charge carriers is the origin of ferromagnetism. The magnetic interactions were better understood by codoping with nonmagnetic impurities.

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Leyla Colakerol Arslan
Gebze Inst of Tech

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