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Evidence of MnAs precipitates in a diluted magnetic semiconductor (Ga,Mn)As TAESOOON HWANG, SOONCHIL LEE, Dept of physics, Korea Advanced Institute of Science and Technology, Daejeon Korea, S. H. CHUN, Dept of Physics, Sejong University, Seoul Korea, H.K. CHOI, Y.S. KIM, Y.D. PARK, School of Physics, Seoul National University, Seoul Korea — Local magnetic field in (Ga,Mn)As epilayers with 500 nm thickness having 3.6% and 5.8% Mn was studied by zero field nuclear magnetic resonance (NMR) at liquid helium temperatures. The macroscopic magnetic and transport properties of the epilayers are quite similar to other previously reported low temperature molecular beam epitaxy prepared samples. We carefully searched for NMR signal from 20 MHz to 250 MHz, but only the spectrum of MnAs precipitations of hexagonal NiAs structure was observed. No evidence for the magnetism due to the substituted Mn ions was observed by NMR within the frequency range investigated. About 1/7 of Mn atoms incorporated into the sample participates in the formation of precipitates whose size is as small as to favor formation of single magnetic domains. Temperature dependence of magnetic moment of MnAs precipitations estimated by NMR frequency below 12 K indicates that its T_c should be much lower than that of bulk. The magnetization of MnAs precipitations decreases faster with increasing temperature for samples with a lower transition temperature. The origin of this correlation between the critical temperatures of MnAs precipitates and the single phase (Ga,Mn)As is not fully understood at this moment.

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