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The influence of a Pb surfactant on Mn delta-doped layers on Si(001) S. KAHWAJI, Dalhousie University, Halifax, Canada, S. ROORDA, Universite de Montreal, Montreal, Canada, S. Q. F. XIAO, R. A. GORDON, E. D. CROZIER, Simon Fraser University, Burnaby, Canada, M. D. ROBERTSON, Acadia University, Wolfville, Canada, T. L. MONCHESKY, Dalhousie University, Halifax, Canada — The high growth temperatures normally required for MBE growth of Si pose a challenge for the growth of dilute magnetic semiconductors based on Si. With the use of a Pb surfactant, we can drop the growth temperature of Si(001) below 200^{o}C, while preserving epitaxial growth, as shown by RHEED and TEM. The Pb surfactant also influences how a single Mn delta-doped layer grows on Si(001). For 0.7 monolayer Mn deposition onto Pb/Si(001), RBS/channeling measurements show that 25% of the Mn occupies a substitutional-like site. This fraction increases with decreasing Mn concentration. Polarization-dependent XAFS measurements suggest that the samples grown without Pb exhibit a CsCl-like structure. XAFS results for 0.7 ML Mn on Pb/Si(001) differ from growth without Pb, with 2 types of Si neighbors at short (in-plane) and long Mn-Si distances and a ratio of coordination numbers comparable to the RBS results.

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