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**Structural, AFM, MFM and magnetic studies of $LaMnO_3$ thin films prepared by atomic layer deposition method** MUKESH CHANDRA DIMRI, HIMANI KHANDURI, National Institute of Chemical Physics and Biophysics, Tallinn, Estonia, SAMI VASALA, Department of Chemistry, Aalto University School of Chemical Technology, Finland, SILVER LEINBERG, RÜNNO LÕHMUS, Institute of Physics, Faculty of Science and Technology, University of Tartu, Tartu, Estonia, JÜRI KRUSTOK, Tallinn University of Technology, Tallinn, Estonia, MAARIT KARPPINEN, Department of Chemistry, Aalto University School of Chemical Technology, Finland, RAIVO STERN, National Institute of Chemical Physics and Biophysics, Tallinn, Estonia — Structural, microstructural and magnetic properties of the thin films of $LaMnO_3$ (LMO) have been investigated and will be presented. Thin films were deposited by atomic layer deposition (ALD) method on silicon substrates. Effects of various process parameters have been studied on LMO thin films. Single phase perovskite crystal structure was confirmed from the X-ray diffraction and Raman spectra. SEM/AFM studies confirm the uniform and high quality films grown with grains in a range of 20-100 nm, depending on preparation conditions. MFM images measured at low temperature (65K), show different magnetic domains in films annealed in $N_2$ and $O_2$ environments. Stoichiometry, microstructure and magnetic properties of films strongly depend on annealing environments; however there was no change in their crystal structure. Curie temperature in those LMO thin films annealed in $N_2$ and $O_2$ atmospheres were 200 and 250K, respectively. Enhanced Curie temperature from the ideal value ($\sim$140 K) can be related to non-stoichiometry in our LMO films.

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