

## FABRICATION AND STUDY OF $\text{GdMnO}_3$ MULTIFERROIC THIN FILMS

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The compound  $\text{GdMnO}_3$  is multiferroic orthorhombic rare-earth manganite. Multiferroics represent the unique class of materials that shows coexistence of electrical and magnetic ordering. Their study is interesting as from fundamental point as from the point of new transformers and devices design.

New laboratory technology for  $\text{GdMnO}_3$  thin film fabrication by magnetron ion-plasma sputtering has been elaborated. Thin film samples of  $\text{GdMnO}_3$  were grown on the  $\text{NdGaO}_3$  single crystal substrate. X-ray structural and phase analysis of the samples has been carried out.

Study of samples magnetic properties using squid-magnetometer Quantum Design MPMS-5XL. Presence of characteristic peculiarities at temperature dependencies of magnetic susceptibility indicate phase transitions in  $\text{GdMnO}_3$ , which were found formerly for bulk single crystals, together with X-ray data has revealed that at definite technological regimes the samples structure and composition correspond to desirable ones. Such samples are multiferroics and their quality enables to carry out correct study of thin film  $\text{GdMnO}_3$  properties.