o.m2.p7 **Anomaly of structural properties in PMN at low temperatures.** A.R. Lebedinskaya,[1] M.F. Kupriyanov[2]. *[1]Department of Physics and Chemistry, Azov - Black Sea State Agro - Engineering Academy,Zernograd, Rostov Region, 347720, Russia. [2] Department of Physics, Rostov State University , Rostov-on-Don, 344104, Russia E-mail: lebed@zern.donpac.ru*
Keywords: perovskites.

Results of series of X-ray analysis studies of lead magnesium niobate $PbMg_{1/3}Nb_{2/3}O_3$ (PMN) single crystal are presented. It was studied in detail at the temperatures of 103 K, 183 K, 203 K that below a temperature of the diffuse dielectric permittivity maximum (T_m). In our investigation we observed the abnormal decrease of a cell parameter in PMN at the temperatures of 183 and 203 K.The analysis of the electron density distribution in PMN showed the anisotropy of the electron density distribution for the O atoms at low temperatures especially at 183K and 203 K too In our opinion , the possible reasons for the anomaly in the temperature dependence of lattice parameters below T_m at a relaxor ferroelectric phase transition in PMN in the vicinity of the phase transition may be the weakening of a long interaction in the electron crystal sublattice, which are a cause for the decrease of a radius of correlation interaction and leads to a relative " release" of rotational modes of vibrations that is accompamied by the coordinated rotations of oxygen octahedra BO_6. It is quite evident that at the such rotations of octahedra the O-B-O-B-O chains become zigzag and the mean lattice parameters (interatomic distances B-B) decrease. In this case, the relaxation rotations of oxygen octahedra BO_6 (second - order phase transition) are possible in the vicinity of T_m are a cause for the appearance of superstructure. Also it has been established that the disorder in shiftings of Pb atoms below T_m develops successively with lowering temperature and correlates with the shiftings of O atoms and effect of Mg/Nb ordering.

o.m2.p8 **Synthesis of $La_{1-x}Ca_xMnO_{3\pm\delta}$ by wet chemical routes.** C. Vázquez-Vázquez, S. Dosil-Caamaño, M.A. López-Quintela. *Universidade de Santiago de Compostela. Facultade de Química. Departamento de Química Física. Avenida das Ciencias, s/n. E-15706 Santiago de Compostela (Spain).*
Keywords: perovskite, nanoparticles, X-ray powder diffraction.

$La_{1-x}Ca_xMnO_{3\pm\delta}$ perovskites (with x= 0 and 0.33) have been prepared by two different wet chemical routes:

(1) A sol-gel process using urea as gelifying agent. Ions remain randomly distributed into the structure of the gel and the crystallization of the $La_{1-x}Ca_xMnO_{3\pm\delta}$ perovskites occurs around 500-600 ºC.

(2) A method starting from the synthesis of potassium hexacianomanganate(III) and afterwards precipitating the corresponding $La_{1-x}Ca_x$-hexacianomanganate(III) from an aqueous solution. Thermal decomposition of this complex at different temperatures leads to the crystallization of $La_{1-x}Ca_xMnO_{3\pm\delta}$ perovskites.

Samples were characterized by x-ray, and structural and microstructural information were extracted using the Rietveld method. Oxygen content was determined by iodometric titration and particle size was determined by transmission electron microscopy.

A comparison of the physicochemical properties of the samples obtained by the two chemical routes will be presented.