THE PECULIARITIES OF THE NMR SPIN-LATTICE RELAXATION IN PROTON EXCHANGED $LINBO_3$

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The temperature dependence of the spin-lattice relaxation time T_1 of Li^7 nuclei in the temperature range (170-430 K) was investigated in $LiNbO_3$ polycrystalline samples: the clean and annealed ones in a hydrogen environment at temperature around 1000° C. The anomaly in the temperature dependence of T_1 was found in range 300-340 K for both pure and annealed crystals. The reduction of the time T_1 in the annealed lithium niobate crystal is caused by the creation of point defects (F^+ or F-centers), with the dominant F-centers contribution. An increase in the activation energy in the annealed crystal can be explained by the following. It is known for the pure lithium niobate that an oscillation of lithium occurs in a symmetrical potential consisting of three wells. Formation of the oxygen vacancies in the annealed crystals is accompanied with extrinsic protons occupation of the vacancies. It leads to the symmetry violation and causes an i ncrease of the activation barrier.