INVESTIGATION OF lATTICE DYNAMICS AND SYMMETRY OF HYDROGEN-CONTAINING IODATE CRYSTALS BY IR AND NQR METHODS

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The results of investigations of the lattice dynamic and symmetry of the hydrogen-containing iodate crystals in the wide temperature range, including temperatures of the phase transitions, is presented. It was shown, that these crystals have similar structure and have different properties: piezoelectric, ferroelectric, untiferroelectrc, dielectric and other. The observed properties, as it was founded by us in previous works, determine by energy and state of hydrogen bonds, which form unit cell of investigated crystals. The IR spectrum analysis of of these crystals in the hydrogen vibration region was done. It was shown, that center-symmetric crystals due to the existence of symmetric hydrogen bonds with two-minimum proton potential, which form hydrogen net-work, undergo the second type phase transitions. The asymmetric hydrogen bonds can provide the observed first (displace) or second (untiferroelectric) type phase transitions. The analyze of the pressure dependencies of ^{127}I NQR spectra of these crystals lead to conclusions that all hydrogen bonds, independently on their symmetry, stay more symmetric under hydrostatic pressure (so called by us effect of symmetrization of the hydrogen bonds).