increases at the same time.

The magnetic moment of the first excited state of Sn^{119}, calculated from the obtained nuclear gamma-resonance spectra, is 0.67 ± 0.01 nuc. magnetons, in agreement with the data of [6].

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ISOTOPIC EFFECT IN THE FERROELECTRIC $NaH_3(SeO_3)_2$

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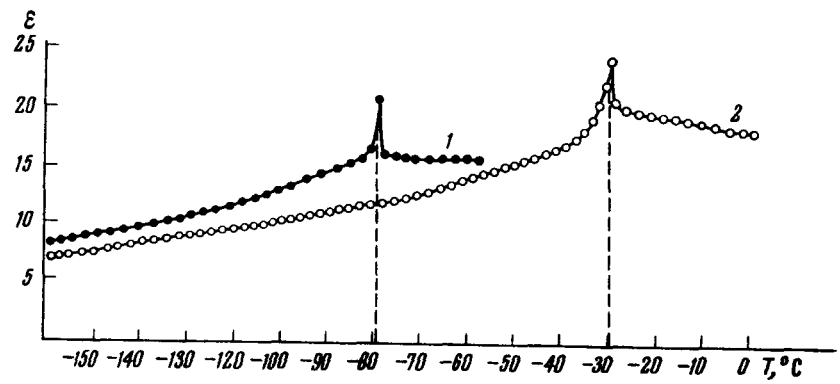
The ferroelectric properties of sodium hydroselenite $NaH_3(SeO_3)_2$ (Curie point $T_c = -79^\circ C$) were investigated by Pepinsky and Vadam[1, 2]. Of great interest in explaining the nature of the spontaneous polarization in this compound is the isotopic effect when the hydrogen is replaced with deuterium.

We report here the results of a study of the temperature dependence of the dielectric constant of powdered samples of $NaD_3(SeO_3)_2$.

The sodium deuteroselenite was obtained by crystallization from a solution in D_2O (99.5% pure), in which the calculated amounts of Na_2SeO_3 and D_2SeO_3 were dissolved. The selenious acid D_2SeO_3 was obtained in turn from the reaction between selenious anhydride SeO_2 and heavy water.

Tablets 1 - 2 mm thick and 14 mm in diameter were prepared from the $NaD_3(SeO_3)_2$ and placed between the electrodes of a parallel-plate capacitor. The capacitance was measured with the aid of a conventional bridge circuit at about 200 kcs. The measurements were made in the temperature range from -170° to 0°C.



Temperature dependences of the dielectric constants of polycrystalline $NaH_3(SeO_3)_2$ (1) and $NaD_3(SeO_3)_2$ (2).

The figure shows the obtained temperature dependence of the dielectric constants of $NaD_3(SeO_3)_2$. For comparison, the temeprature dependence we obtained for powdered $NaH_3(SeO_3)_2$ is shown in the same figure. Repeated measurements of tablets prepared in various manners yielded identical results.

The figure shows that the peak of the dielectric constant of polycrystalline $NaH_3(SeO_3)_2$ lies at -79°C, which coincides with the previously determined Curie point of this ferroelectric[1, 2]. The temperature dependence of the dielectric constant of $NaD_3(SeO_3)_2$ duplicates that of $NaH_3(SeO_3)_2$, but is shifted 50° in temperature, with a peak at -29°C, which can be assumed to be the Curie point of the deuteroselenite.

Thus, the shift of the Curie point of the hydroselenite when the hydrogen is replaced by deuterium is of the same order of magnitude as that in KH_2PO_4 (90°), KH_2AsO_4 (66.4°), and $Ag_2H_3IO_6$ (40°)[3]. It can be assumed on this basis that these ferroelectrics have a similar spontanous-polarization mechanism in which an important role is played by the ordering of the hydrogen bonds.

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75-MICRON LASER

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The first laser design was proposed in 1958[1] in the form of an ammonia maser operating in the far infrared (several hundred microns). The actually constructed laser, however, operated in the visible region[2].

A proposal was made in 1959 to use a discharge-excited gas as the active medium[3]. This method makes it possible to construct lasers operating in a broad range of wavelengths. It is therefore of interest to construct a laser operating in the far infrared and using a gas discharge. In the design of gas lasers for the far infrared attention is usually paid to close levels of the higher states[4]. It must be noted that in Xe overlap of the p and d series takes place even for the lower states, so that lasing can be produced with a series of 3d → 2p transitions at relatively weak excitation. An attempt to obtain laser action with transitions of the 2p → 3d type may fail because of the rapid depletion of the 2p levels resulting from the short-wave spontaneous 2p → 1s transitions[5].

The transition with longest wavelength between the states 2p and 3d in Xe is $2p_5 \rightarrow 3d_5$ (75.5778 μ), the states of which have several distinctive features that make lasing possible in this transition. Moreover, we can