SESSIONS OF THE PHYSICAL MATHEMATICAL DEPARTMENT OF THE ACADEMY OF SCIENCES OF THE USSR

A Session of the Physical Mathematical Department of the Academy of Sciences of the USSR was held in Moscow on September 20, 1946. The following papers on physics were read.

G. L a n d s b e r g and F. B a r y s h a n s k a y a (*Lebedev Physical Institute, Academy of Sciences of the USSR*). **Scattering of Light in Crystalline Hydroxydes and Hydrogen Bond.**

A method for investigating the scattering spectra of fine-crystalline substances of high dispersion (thin powders) was elaborated. With the help of this method the authors succeeded in studying the structure of the spectrum of O—H-vibration in a great number of anhydrous hydroxydes, their crystal hydrates and other formations containing crystallization water.

The obtained results are interpreted from the point of view of the conception of the hydrogen bond. The comparison with the X-ray analysis data in some cases permits to connect the presence or the absence of the spectroscopically observed hydrogen bond with the distance between the neighbouring hydroxyde groups. These conclusions may be also useful in some crystallographic analyses.

Investigations of the scattering spectra at low temperatures (down to 100°K) have shown a decrease in the width of the scattering band with temperature and even a conversion of the band into a sharp line. These regularities permit to interpret the broading of lines, in the presence of the hydrogen bond, as an effect of the fluctuations of mean intermolecular distances. Some quantitative estimations, confirming such an interpretation, are given.

L. B r e k h o v s k i k h (*Lebedev Physical Institute, Academy of Sciences of the USSR*). **Propagation of Sound and Radio Waves in Layer between Two Half-Spaces.**

While examining the propagation of radio and sound waves from a point source situated in a layer, there appears that the general equations and boundary conditions in both cases may be formulated in the same way.

The general solution of the problem may be represented in the form of a definite integral.

The expression for so-called "Flankenwelle" or the Mintrop wave, which is well known in seismology, also follows from the general solution. The obtained solution permits to make a full theoretical investigation of the Mintrop waves. The method offers also the possibility to solve the following problems, being of both practical and theoretical importance: radiotransmission in the case of a receiver and an emitter located under the earth's surface, reflection by a region of finite size, etc. The solution gives the law of the decrease in the sound pressure or in the electromagnetic field strength with increasing distance from the source. Theoretical laws obtained in this way are in a satisfactory agreement with those found experimentally.

S. P o p o v (*Institute of Crystallography, Academy of Sciences of the USSR*). **New Technical Method for Obtaining Corundum Crystals.**

The synthetic crystals of corundum were obtained usually by means of Verneil's method. This method gives single crystals having a pear-like shape.

Almost all the treatment of synthetic corundum is made by means of diamond powders and diamond tool. In order to reduce the diamond expenditure and to increase the production a method of obtaining corundum single crystals having the shape of long thin rods was elaborated.

The problem of obtaining synthetic rod-like corundum single crystals with a given orientation of crystallographic axes was also solved. This is of technical importance, since the quality of synthetic corundum production strongly depends upon the orientation of crystallographic lattice in manufactured objects. The method elaborated permits to obtain the colourless corundum as well as dark ruby.

EVENTS

On November 25 — December 4, 1946 Session of the Academy of Sciences of the USSR was held in Moscow.

V. M. Molotov, Minister for Foreing Affairs of the USSR, was elected to be the Honorary Member of the Academy of Sciences of the USSR.

The following physicists were elected to be Members of the Academy of Sciences of the USSR:

L. D. Landau, G. S. Landsberg, M. A. Leontovich, P. I. Lukirsky, D. V. Skobelzyn.

The following physicists were elected to be Corresponding Members of the Academy of Sciences of the USSR: A. I. Alichanian, L. A. Arzimovich, N. N. Bogolubov, J. B. Chariton, I. M. Frank, S. E. Frish, G. A. Grünberg, E. F. Gross, S. T. Konobeevsky, V. K. Kuznetzov, A. I. Shalnikov, V. I. Veksler, S. A. Vekshinsky, J. B. Zeldovich.