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wavelength λ = 0.77 mm (see Fig. 2), where T_H is the transmission coefficient in the presence of a magnetic field. We note that when even a weak longitudinal field is applied (H_0 ∿ 100 Oe) the resonant absorption decreases by a factor 3.5, and application of H_0 ∿ 1400 Oe makes the resonance almost unobservable.

An external field in the opposite direction exerts a smaller influence. No influence of the transverse field on the investigated resonance was observed.

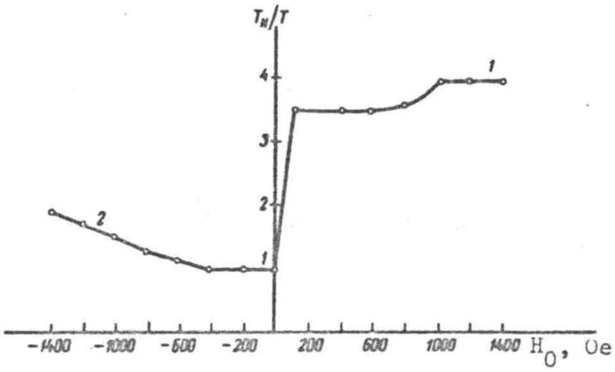

Fig. 2. Decrease of resonant absorption as a function of H_0 at λ = 0.77 mm.

It is interesting to note that the values of the fields leading to the vanishing of the resonance correspond to fields in which the domain structure vanishes and the orthoferrites become magnetized [4]. The asymmetry of curves 1 and 2 in Fig. 1 can be explained in analogy with the explanation used in [4] for the asymmetry of the hysteresis loops in orthoferrites.

Since the observed resonant absorption occurs only in the presence of a domain structure, it can be assumed that it is due to the interaction of the submillimeter radiation with the high-frequency vibrations in the domain walls. Such vibrations exist possibly alongside the low-frequency vibrations of the domain boundaries [5] in systems with two sublattices.

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MELTING CURVE OF MOLYBDENUM UP TO 90 KBAR

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In spite of the fact that molybdenum is one of the best known widely-used high-melting-point metals and one of the most important alloying elements, its melting curve has hitherto never been measured. This is due to the fact that traditional melting-temperature measurements with thermocouples, which ensure high measurement accuracies, become unsuitable because of melting of the thermocouple material. For this reason the melting temperature of molybdenum, even at atmospheric pressure, is known only accurate to ±50°C [1].

We deemed it interesting to measure the melting curve of molybdenum by an optical method. The apparatus and the procedure for the measurement of the temperatures and pressures were described by us in detail in earlier papers [2].

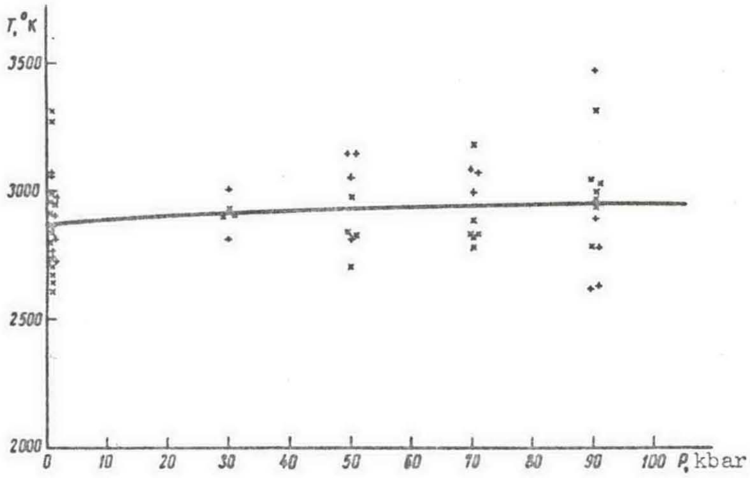

Fig. 1. Melting curve of molybdenum up to 90 kbar, calculated simultaneously from all the experimental points. + - temperatures determined from I_1/I_2, × - temperatures determined from I_2/I_3.

We recall only that the experiment was based on a determination of the ratio I_1/I_2 of the radiation intensities in two narrow spectral regions corresponding to the wavelengths λ_1 and λ_2, and a subsequent comparison of this ratio with Planck's law.

We used for the research molybdenum containing not more than 0.05% impurities.

To reduce the errors resulting from selective absorption of the radiation by the vapor of the investigated substance, we determined simultaneously the intensity ratios I_1/I_2 and I_2/I_3 of two pairs of sections. As seen from the figure, the corresponding temperatures remain within the limits of measurement error. The melting curves calculated separately from these temperatures practically coincide with the curve calculated from all the experimental points. The figure shows that the melting temperature of molybdenum increases monotonically with pressure, to 2955°K at 90 kbar, if the initial melting point is taken, in accord with [1], to be 2883 ± 50°K at room temperature. The experimental data reduced by the least-squares method can be represented also in the form of the linear equation

$$T = 2883 + 0.8 \cdot 10^{-3} P;$$

where T is the melting temperature in °K and P is the pressure in bars. The errors were calculated from the deviations of the experimental points from the smoothed curve. The probable error in the measurement of the temperature is ±4%, and in the measurement of pressures ±4%.

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