counter by the formula $N_{\beta\gamma} = N_0 \exp(-t/\tau_\gamma)$ if $t \gg \tau_0$. Here τ_γ is the mean life of the excited nuclear state with respect to γ emission. The data obtained are shown in the figure. Treatment of the data by the method of least squares yields

$$\tau_\gamma(\mathrm{Rb}^{85}) = (1.14 \pm 0.12)\cdot 10^{-9}\ \text{sec},$$
$$\tau_\gamma(\mathrm{Pr}^{141}) = (2.32 \pm 0.17)\cdot 10^{-9}\ \text{sec}.$$

The value of τ_γ for Pr^{141} agrees with the result of de Waard and Gerholm.[1]

The ratios of the experimentally determined lifetime to that calculated for single-particle transitions from the formulas of Moszkowski[2] are 210 and 230 for Rb^{85} and Pr^{141}, respectively.

[1] H. de Waard and T. R. Gerholm, Nuclear Physics **1**, 281 (1956).

[2] S. A. Moszkowski, Beta- and Gamma-Ray Spectroscopy, p. 391, ed. Kai Siegbahn, North-Holland Publ. Co., Amsterdam 1955.

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ON THE PROBLEM OF THERMAL CONDUCTIVITY AND ABSORPTION OF SOUND IN SUPERCONDUCTORS

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In the present note we consider the absorption of sound in superconductors for the case where $\omega\tau \ll 1$ (ω is the sound frequency and τ the relaxation time). If such a sound field is present, the electron finds itself in a lattice with a slightly altered lattice constant. The absorption of sound energy occurs when we take into account the irreversibility of the process of deforming the lattice.

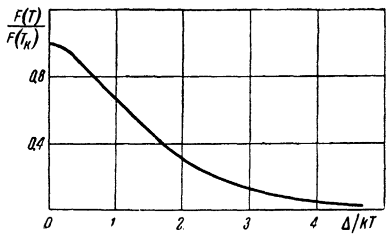
The solution of the transport equation for the distribution function of the electronic excitations of the superconductor which interact with the phonons, and the subsequent evaluation of the dissipative function which determines the absorption of the sound energy, leads to the following result for the coefficient for the absorption of sound:

$$\gamma_s = 4\gamma_n (e^b + 1)^{-2} F(T_k) / F(T). \qquad (1)$$

Here $\gamma_n = \text{const}\cdot T^{-5}$ is the coefficient for the absorption of sound in the normal metal, evaluated by Akhiezer in reference 1; $b = \Delta/kT$; Δ is the gap in the energy spectrum;

$$F(T) = 96\zeta(4)\ln(1+e^{-b}) + \sum_{s=1}^{\infty} s^{-5}e^{-2bs}(80b^4s^4 + 160b^3s^3 + 240b^2s^2 + 240bs + 120) - \ln(e^b+1)\sum_{s=1}^{\infty} s^{-4}e^{-2bs}(64b^3s^3 + 96b^2s^2 + 96bs + 48)$$

($\zeta(s)$ is the zeta-function). We have given a graph of $F(T)/F(T_k)$ in the figure.



We can consider the problem of the influence of the electron-phonon interaction on the electronic thermal conductivity of superconductors in a similar way. This interaction, as was already noted by Geĭlikman[2] must be taken into account at temperatures close to T_k. We get in this case for the coefficient of thermal conductivity

$$\varkappa_s = \varkappa_n \frac{12F(T_k)}{\pi^2 F(T)}\left[\sum_{s=1}^{\infty}\frac{(-1)^{s+1}}{s^2}e^{-bs} + b\ln(1+e^{-b}) - \frac{b^2}{2(e^b+1)}\right]^2, \qquad (2)$$

$\kappa_n = \text{const}\cdot T^{-2}$ is the thermal conductivity in the normal state considered by Landau and Pomeranchuk in reference 3.

We give here some values of κ_s/κ_n:

$\Delta/kT =$	0	0.25	0.5	0.75	1
$\varkappa_s/\varkappa_n =$	1	0.81	0.72	0.58	0.46

In conclusion I express my sincere thanks to B. T. Geĭlikman for suggesting this subject and for valuable advice.

[1] A. I. Akhiezer, J. Exptl. Theoret. Phys. (U.S.S.R.) **8**, 1331 (1938).

[2] B. T. Geĭlikman, J. Exptl. Theoret. Phys. (U.S.S.R.) **34**, 1042 (1958), Soviet Phys. JETP **7**, 721 (1958).

[3] L. D. Landau and I. Ya. Pomeranchuk, J. Exptl. Theoret. Phys. (U.S.S.R.) **7**, 379 (1937).

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