Bibliographie

[1] A. L. JAIN et S. H. KOENIG, Phys. Rev. **127**, 442 (1962).
[2] G. E. SMITH, G. A. BARAFF et J. M. ROWELL, Phys. Rev. **135**, 1118 (1964).
[3] K. TANAKA, J. Phys. Soc. Japan **20**, 1374 (1965); **20**, 1633 (1965).
[4] T. MORIMOTO et J. TAKAMURA, J. Phys. Soc. Japan **18**, 921 (1963); **22**, 89 (196
[5] T. MORIMOTO, J. Phys. Soc. Japan **21**, 1008 (1966).
[6] B. H. SCHULTZ et J. M. NOOTHOVEN VAN GOOR, Philips Res. Rep. **19**, 103 (1964
J. M. NOOTHOVEN VAN GOOR, Phys. Letters (Netherlands) **21**, 603 (1966).
J. M. NOOTHOVEN VAN GOOR, Conf. Semi-Metal and Narrow-Gap Semic
Durham 1968 (non publié).
[7] L. C. TOWLE, A. CYBRIWSKY et R. STAJDOHAR, J. appl. Phys. **38**, 668 (1967).
[8] R. T. BATE, W. R. HARDIN et M. G. EINSPRUCH, J. appl. Phys. **38**, 4852 (196
[9] N. B. BRANDT et M. V. RAZUMENKO, Soviet Phys. — J. exper. theor. Phys. 1
(1963).
[10] G. A. ANTCLIFFE et R. T. BATE, Phys. Letters (Netherlands) **23**, 622 (1966).
[11] R. T. BATE et N. G. EINSPRUCH, Phys. Rev. **153**, 796 (1967).
[12] R. N. BHARGAVA, Phys. Rev. **156**, 785 (1967).
[13] G. A. ANTCLIFFE et R. T. BATE, Phys. Rev. **160**, 531 (1967).
[14] B. LAX, J. G. MAVROIDES, H. J. ZEIGER et R. J. KEYES, Phys. Rev. Letters **5**, 241
[15] M. H. COHEN, Phys. Rev. **121**, 387 (1961).
[16] A. A. ABRIKOSOV et L. A. FALKOVSKII, Soviet Phys. — J. exper. theor. Phys. 1
(1963).
[17] M. R. ELLETT, R. B. HORST, L. R. WILLIAMS et K. F. CUFF, Proc. Internat
Semicond., Kyoto 1966 (p. 669).
[18] L. ESAKI et P. J. STILES, Phys. Rev. Letters **14**, 902 (1965); Proc. Internat.
Semicond., Kyoto 1966 (p. 589).
[19] C. HERRING et E. VOGT, Phys. Rev. **101**, 944 (1956).
[20] G. E. SMITH, R. WOLFE et S. E. HASZKO, C.R. 7^{e} Congrès Internat. Semicondu
Dunod, Paris 1964 (p. 399).
[21] R. N. ZITTER, Phys. Rev. **127**, 1471 (1962).
[22] A. C. BEER, Solid State Phys., Suppl. 4, (1963).
[23] J. L. MALGRANGE, Thèse de Doctorat, Paris 1969.
[24] R. S. ALLGAIER, Phys. Rev. **152**, 808 (1966).
[25] R. BARRIE, Proc. Phys. Soc. **B69**, 553 (1956).
[26] R. B. DINGLE, Phil. Mag. **46**, 831 (1955).
[27] A. G. SAMOILOVICH, I. YA. KORENBLIT, I. V. DAKHOVSKII et V. D. ISKRA, Soviet Ph
— Solid State **3**, 2385 (1962).
[28] W. S. BOYLE et A. D. BRAILSFORD, Phys. Rev. **120**, 1943 (1960).
[29] J. E. ROBINSON et S. RODRIGUEZ, Phys. Rev. **135**, A779 (1964).
[30] N. SCLAR, Phys. Rev. **104**, 1548 (1956).

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ffect of High Pressure on the Energy Gap of Indium and Thallium Superconducting Films

By

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effect of high pressure (up to 15000 atm) on the energy gap of In and Tl supercon- films was investigated by the tunnel effect on superconductor–barrier–superconduc- stems. As directly found in the experiments, the In values $2\,\Delta/kT_c$ indicate a reduc- the electron–phonon interaction under pressure for this metal. In the range up to the value $2\,\Delta/kT_c$ for Tl remained constant within the experimental error and was to be 3.64 ± 0.06.

етодом туннельного эффекта на системах сверхпроводник–барьер–сверх- дник изучалось влияние высоких (до 15000 атм) давлений на энергети- ю щель сверхпроводящих пленок In и Tl. Непосредственно найденные спериментах значения $2\,\Delta/kT_c$ для индия указывают на ослабление элек- фононного взаимодействия под давлением для этого металла. Для таллия ласти давлений до 8 катм в пределах погрешности эксперимента величина T_c оставалась постоянной и составляла 3,64 ± 0,06.

1. Introduction

The central part of microscopic theory of superconductivity [1] is the presence an energy gap in the spectrum of elementary excitations:

$$\Delta = \frac{\hbar\,\omega}{\sinh\left(\frac{1}{N\,V}\right)}, \tag{1}$$

re ω and V are cut-off frequency and interaction strength, respectively, is the state density on the Fermi surface. In this theory the energy gap is pled with the critical temperature by the universal relation

$$\frac{2\,\Delta}{kT_c} = 3.528\,. \tag{2}$$

s value characterizes the electron–phonon interaction strength which ers for real superconductors from 3.528, reaching a maximum value of 4.6 Hg [2].

It is interesting to investigate the influence of different factors on $2\,\Delta/kT_c$ one crystal modification. In this respect high pressures as a method are st perspective.