

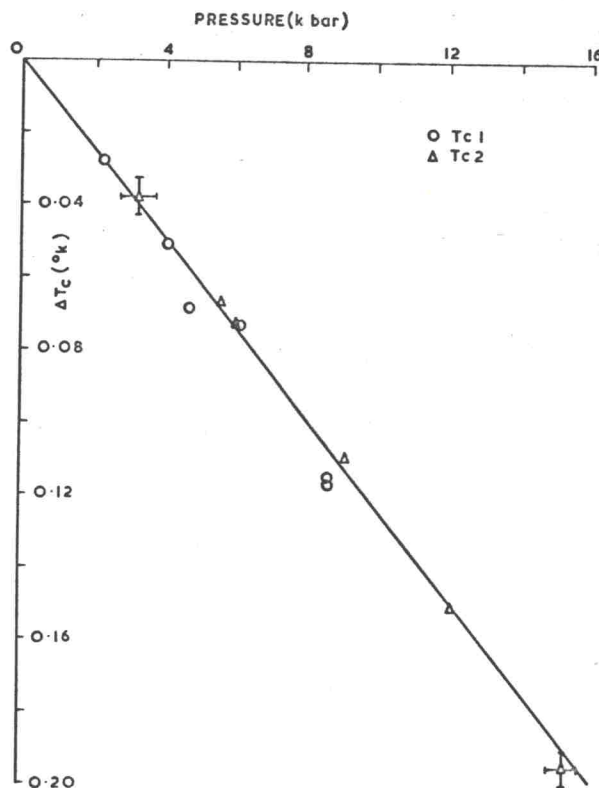


Fig. 1. Variation of superconducting transition temperature as a function of pressure for technetium.

should be equivalent. Furthermore, from general considerations we would expect the density of electron states at the Fermi surface to decrease with the application of pressure, and the available thermal expansion measurements [11] on transition metal elements, including Ti, V and Nb support this conclusion.

It is evident from the present measurement

for Tc, combined with the previous measurements for Ta [8,12] Mo [10], Re [2] and Os [13] all of which have negative pressure dependences and Ru [13], which has a zero pressure dependence, that positive values of the pressure dependence of T_c only occur among the early 3d and 4d members of the transition series. Thus if, as suggested [7], this possible pressure dependence is associated with a decrease in the repulsive Coulomb interaction then the effect on T_c of such a decrease for the later transition elements must be more than compensated for by other changes (most probably by a decrease in the density of states).

References

1. S. T. Sekula, R. H. Kernohan and G. R. Love, Phys. Rev. 155 (1967) 364.
2. C. W. Chu, T. F. Smith and W. E. Gardner, Phys. Rev. Letters 20 (1968) 198.
3. B. T. Matthias, Phys. Rev. 97 (1955) 74.
4. B. R. Coles, Solid State Comm. 1 (1963) 5.
5. C. W. Chu, H. L. Luo, T. F. Smith and W. E. Gardner, A.P.S. Bulletin 13 (1968) 401.
6. N. B. Brandt and N. I. Ginzburg, Zh. Eksp. i Teor. Fiz. 46 (1964) 1216; 49 (1965) 1706; 51 (1966) 59; Soviet Physics JETP 19 (1964) 823; 22 (1966) 1167; 24 (1966) 40.
7. W. E. Gardner and T. F. Smith, Phys. Rev. 144 (1966) 233; C. W. Chu and T. F. Smith, unpublished.
8. W. Gey and G. Van Heyden, Z. Physik 193 (1966) 65.
9. D. Köhlein, Z. Physik 208 (1968) 142.
10. J. L. Olsen, E. Bucher, M. Levy, J. Muller, E. Corenzwit and T. H. Geballe, Rev. Mod. Phys. 36 (1964) 168; C. Palmy, private communication.
11. G. K. White, Cryogenics 2 (1962) 292; K. Andres, Phys. Kond. Mat. 2 (1964) 294.
12. L. D. Jennings and C. A. Swenson, Phys. Rev. 112 (1958) 31.
13. E. Bucher, J. Müller, J. L. Olsen and C. Palmy, Cryogenics 5 (1965) 283.

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