...p integral, assumed to dominate all other ...erlaps,

$$\ldots \approx |J|^{-1} \ . \qquad (2)$$

...der the same assumptions the linear intraband ...ctron-phonon coupling [7] is essentially pro...rtional to $q_0 J$, where the Slater coefficient q_0, ...resumably weakly dependent on stress, de...ribes the exponential decrease, $\exp(-q_0 r)$, of ...e involved d-functions. Therefore

$$\ldots = q_0^2 |J|^2 \ . \qquad (3)$$

...he constant of proportionallity depends some...hat on the procedure and the model ‡ used to ...alculate V, and physically, on the appropriately ...veraged renormalized phonon frequency. The ...ressure dependence of the constant of propor...tionality is expected to arise mainly from the ...ariation of this latter quantity, i.e., to be ...oughly model independent. The renormalized ...honon frequencies usually increase somewhat ...nder pressure, reducing V. On the contrary the ...andwidth $4|J|$ increases, increasing V. Here we ...stimate this latter effect which is dominant, ...iving the upper bound to the variation of T_c ...omputed from eq. (1): the variation of $|J|$ due to ...he strain ϵ is $\delta|J| = -aq_0|J|\epsilon$, where a is the ...teratomic distance in the chain at zero pres...ure. Combining this results with eqs. (1)-(3) we obtain

$$\delta T_c/T_c \lesssim -3aq_0\epsilon = aq_0 p/K \ . \qquad (4)$$

Here p is the applied pressure and K the bulk modulus of the crystal. The term of the order ϵ^2 is still negligible for used pressures.

Experimentally $p/K \approx 1.5\%$ induces $\delta T_c/T_c \approx 4\%$. This is not only in sign but also in rough quantitative agreement with eq. (4) since with* $q_0 \approx 1\ \text{Å}^{-1}$, $aq_0 \approx 2.4$, and the estimated $aq_0 p/K \approx 3.6\%$.

A similar calculation may be done for transition metals on combining the eq. (9) of ref. [7] with the eq. (19) of ref. [9]. It yields for the volume dependence of the Mac Millan quantity $n_F\langle J^2\rangle$ at constant number Q of electrons in the d-band, the expression

$$(\delta \ln n_F\langle J^2\rangle / \delta \ln \Omega)_Q = -\frac{1}{3} aq_0 \ , \qquad (5)$$

in reasonable agreement * with results quoted by Garland and Bennemann [10].

‡ In order to obtain a nonvanishing superconductive coupling for small momentum transfers along the chain a weak interchain coupling must be assumed from the outset [8].

* q_0 in eqs. (4) and (5), since related to the second derivative of the overlap integral with respect to distance, may be somewhat different (larger) than q_0 appearing in eq. (3).

References

[1] T.F. Smith, Phys. Rev. Letters 25 (1970) 1483.
[2] L.R. Testardi, J.E. Kunzler, H.J. Levinstein and J.H. Wernick, Solid St. Commun. 8 (1970) 907.
[3] J. Labbe and J. Friedel, J. Physique 27 (1966) 153.
[4] S. Barišić and J. Labbe, J.P.C.S. 28 (1967) 2477.
[5] J. Labbe, S. Barišić and J. Friedel, Phys. Rev. Letters 19 (1968) 1039.
[6] J. Bonnerot, J. Hallais, S. Barišić and J. Labbe, J. Physique 30 (1969) 701.
[7] S. Barišić, J. Labbe and J. Friedel, Phys. Rev. Letters 25 (1970) 919; S. Barišić, preprint.
[8] S. Barišić, Thesis, to be submitted to the Faculté des Sciences d'Orsay.
[9] S. Barisić, J. Labbe and F. Cyrot-Lackmann, J. Physique 30 (1969) 955.
[10] J.W. Garland and K.H. Bennemann, preprints.

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