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MATHEMATICAL EXPRESSIONS FOR THE INTERCONNECTION OF CONDUCTION ELECTRONS MOTION TOPOLOGY WITH SUPERCONDUCTING TRANSITION TEMPERATURE

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The mathematical expression connected the freedom degree of conduction electron motion with value of superconducting transition temperature was introduced in [1]:

$$T_c = \frac{n_1 + n_2}{n_1 n_2} \times \frac{\left|P_{bin}(N_e) - P_{bin}(N_e - 1)\right|}{k_B} \quad (1),$$

where: n_2 and n_1 are the upper limit and value for the lower boundary of freedom degree of conduction electrons respectively.

The expression (1) can have the following forms in accordance with topology of the motion of the conductor electrons.

1) Within metals the motion of conduction electrons is characterized by values of n_1 and n_2 as 3. That is why in this case the expression (1) has the next form:

$$T_c = \frac{2}{3} \times \frac{\left|P_{bin}(N_e) - P_{bin}(N_e - 1)\right|}{k_B} \quad (2);$$

2) if we investigate the semiconductors we need taking into account cases where n_1 and n_2 can be equal 2 or 3. Taking, in general, n_1 and n_2 equal to 2, we receive the next type of expression (1):

$$T_c = 1 \times \frac{\left|P_{bin}(N_e) - P_{bin}(N_e - 1)\right|}{k_B} \quad (3);$$

3) in the case of one-dimensional motion the value n_1 and n_2 are equal 1 and we receive the next type of expression (1):

$$T_c = 2 \times \frac{\left|P_{bin}(N_e) - P_{bin}(N_e - 1)\right|}{k_B} \quad (4).$$

From the introduced expressions (2-4) is following that the decreasing of freedom degree of conduction electrons causes increases the temperature of the superconducting transition.

1. Yuryeva E.I. *XX Mendeleev Congress on general and applied chemistry*. Five volume book. Vol. 5. Ekaterinburg: Ural Branch of the Russian Academy of sciences, 2006. - p**.** 144.