Review of: "The number of free electrons per atom in a metallic conductor"

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Potential competing interests: No potential competing interests to declare.

1. During the calculation of the radius of conduction electron the author has written that “Since the number of electrons n is equal to N/V then the volume of a conduction electron is: V/N = 1/n = , where the radius, , of the volume occupied by a conduction electron, I think it is not correct because is the effective radius of electron including the volume of ion of the atom also. It never represents the radius of freely conducting electrons.
2. While considering the closest packing, it must be kept in mind that ξ is the radius of effective volume for a conduction electron. The effective volume of a conduction electron is calculated through V/N, where V is the volume of whole crystal which contains not only conduction electrons but also the ions; N the number of conduction electrons. By the way, radius of electron is about a fermi.
3. The author have mentioned that “For example, for the metals lithium and silver ξ are respectively 172 pm and 160 pm and n for the two metals” it indicates that it is very large in comparison of the radius of free electron which is usually of the order of 10^{-15} m. This difference is because of the consideration of effective radius of electron with the consideration of ion of the atom. Thus, the authors calculated radius for the electron can never be considered as the radius of free conducting electrons, because of this large radius author is claiming the entire conducting electrons giving more volume than the volume of the materials considered. Thus, it never can be accepted.
4. The random (Fermi) speed of electrons is very high, and it corresponds to a temperature known as Fermi temperature, approximately 10^4- 10^5 Kelvin which has nothing to do with the room temperature for melting. There are several mechanisms which usually prevent the melting of metals from collisions. Thus, the idea of author that “kinetic energy resulting from the numerous collisions has to be dissipated as heat and the copper wire should heat up very quickly likely to melt. However, there is little evidence that occurs so we can assume that there are much fewer conduction electrons with fewer collisions and more details are available in the original work” is totally wrong.
5. The relativistic consideration of the thermal speed of electrons appears to be a correction.
6. Author has considered the classical and quantum both aspect together in his case which is not permissible simultaneously. Thus, the proposed idea must be discorded.

In view of the above points this article must be rejected otherwise it will not only confuse to the new learner but also mislead to the scientists and students as well.

1. During the calculation of the radius of conduction electron the author has written that “Since the number of electrons n is equal to N/V then the volume of a conduction electron is: V/N = 1/n =4/3pi r^3_s , where the radius, r_s , of the volume

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