Report on the Evaluation of Chapter 17 Nature of the Solid Molecular Bond of the Three Allotropes Of Carbon (Diamond, Fullerene (C_{60}), Graphene, and Graphite) in "The Grand Unified Theory of Classical Physics" by Dr. Randell L. Mills

Revised
Prepared by

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June 28, 2019

Executive Summary

In my analysis, I verified calculations and equations involving the solid molecular bond found in the three allotropes of Carbon, namely 1) Diamond, 2) Fullerene C_{60}, and 3) Graphene and Graphite found in Chapter 17 of the book "The Grand Unified Theory of Classical Physics" by Dr. Randell L. Mills. I verified equations and values to a high degree of accuracy that are associated with these molecular systems. There is a remarkable agreement between the GUTCP calculated values for the energies, distances, and parameters of these molecular systems and my calculations. I verified the entries found in Tables 17. 1 to Table 17.19. I also verified as correct the equations and values found in Equations 17.1 through 17.25.

Purpose

In Chapter 17, the GUTCP book investigates the solid molecular bond of the three forms of Carbon: 1) Diamond, 2)Fullerene C_{60}, and 3)Graphene and Graphite.

In Chapter 17, the book uses previous results from Chapters 14 and 15 to find a, c', 2c'=bond length, b, and e for Diamond. Also, the energies V_e, V_p, T, V_m, and E_{Total} (plus others) are found for the molecule. Geometrical bond parameters are also found. The bond angle parameters for Diamond are also calculated. Finally the total bond energy of Diamond is calculated and compared to the experimental Total Bond Energy. There is remarkable agreement between the two values.

In Chapter 17, the book uses previous results from Chapters 14 and 15 to find a, c', 2c'=bond length, b, and e for Fullerene's two functional groups: the C-C group and the C=C group. Also, the energies V_e, V_p, T, V_m, and E_{Total} (plus others) are found for the molecule. Geometrical bond parameters are also found. The bond angle parameters for Fullerene are also calculated. Finally the total bond energy of Fullerene is calculated and compared to the experimental Total Bond Energy. There is remarkable agreement between the two values.

In Chapter 17, the book uses previous results from Chapters 14 and 15 to find a, c', 2c'=bond length, b, and e for Graphite (and Graphene as well). Also, the energies V_e, V_p, T, V_m, and E_{Total} (plus others) are found for the molecule. Geometrical bond parameters are also found. The bond angle parameters for Graphite/Graphene are also calculated. Finally the total bond energy of Graphite/Graphene is calculated and compared to the experimental Total Bond Energy. There is remarkable agreement between the two values.

Calculation

I have verified that Equations 17.1-17.4 are true. The value in Eqn. 17.3 is correct, as well.

I have verified that Equation 17.7 and its value are correct.

I have verified that Table 17.1 is correct.

I have verified that all calculated entries in Table 17.2 are correct.

I have verified that every entry in Table 17.3 is correct. Except I couldn't verify $E_{coulomb}$ (eV) Final.

Also every calculated entry in Table 17.4 is correct and has been verified by myself.

Every entry has been verified by me to be correct in Table 17.5.

In Table 17.6, I have verified as correct the values in columns 4, 5, 6, and 7. I have verified the values in column 14.

I have verified that the value listed on page 1151, line 25, is correct.

I have verified that the entries in Table 17.7 are correct.

In Table 17.8, I was able to verify as correct all the parameters for the C=C Group and the C-C group..

I have verified that all entries in Table 17.9 are correct.

In Table 17.10, I verified that all calculated values are correct for both the C=C group and the C-C group.

I have verified that all calculated entries in Table 17.11 are correct.

In Table 17.12, I have verified as correct the values in columns 4, 5, 6, and 7. I have verified the values in column 14.

I have verified that Equations 17.8-17.11 and their values are correct as listed.

I have verified that Equation 17.13 is correct as listed.

I have verified that Equations 17.15-16 and their values are correct.

I have verified as correct Equation 17.17.

I have also verified as correct the Equations 17.19-17.20 and their values.

I have verified that Equation 17.22 is correct.

I have verified that Equation 17.25 and its value is correct.

I have verified that all entries in Table 17.13 are correct.

I have shown that all calculated entries in Table 17.14 are correct.

I have shown that all calculated entries in Table 17.15 are correct.

In Table 17.16, I verified that all calculated values are correct.

I have verified that all the values in Table 17.17 are correct.

In Table 17.18, I have verified as correct the values in columns 4, 5, 6, and 7. I have verified the values in column 14.

And I have shown that all values in Table 17.19 are correct.

Conclusion

I was able to verify that the GUTCP results of Chapter 17 are in excellent agreement with my own calculations. I successfully reproduced almost all of the equations and their corresponding values found in Chapter 17. That is, I have verified as correct most of the equations and the values they produce from Equation 17.1 to 17.25. I verified that all entries in Tables 17.1 to 17.19 are correct, with just a few exceptions which could be my fault for not understanding the theory well enough. This chapter demonstrates that the GUTCP theory is successful at describing Diamond, Fullerene C_{60}, Graphene, and Graphite to a high degree of accuracy.

I find my results and calculations to be confirmation that the calculations and equations of Chapter 17 are indeed accurate, valid, and reproducible.