Report on the Evaluation of Chapter 16 Applications: Pharmaceuticals, Specialty Molecular Functional Groups and Molecules, Dipole Moments and Interactions in "The Grand Unified Theory of Classical Physics" by Dr. Randell L. Mills

Revised
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Executive Summary

In my analysis, I verified calculations and equations involving molecular functional groups of NaH, H_2O in vapor phase, H_2O and NH_3, Graphite, Liquid Helium, Solid Neon, Solid Argon, Solid Krypton, and Solid Xenon found in Chapter 16 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 and distances of these molecular systems and my calculations. I verified the entries found in Tables 16.13, 16.14, 16.15, 16.16, 16.20, 16.21, 16.22, 16.23, 16.24, 16.25, 16.26, 16.27, 16.28, 16.29, 16.30, 16.31, 16.32, 16.34, 16.35, 16.38, and 16.41.

Purpose

In Chapter 16, the book uses a force balance equation to find a, c', 2c'=bond length, b, and e for the Sodium Hydride NaH molecule. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Next, the geometrical parameters (a, c', 2c', b, and e) and energies of the hydrogen bond of H_2O in the vapor phase are found. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Next, the geometrical parameters and energies of the hydrogen bond of H_2O and NH_3 are found. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecules.

Then the theory is used to find the interplane van der Waals cohesive energy of graphite. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Next the geometrical parameters a, c', 2c'=bond length, b, and e and energies due to the interatomic van der Waals cohesive energy of Liquid Helium are found. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Next the geometrical parameters a, c', 2c'=bond length, b, and e and energies due to the interatomic van der Waals cohesive energy of Solid Neon are found. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Next the geometrical parameters a, c', 2c'=bond length, b, and e and energies due to the interatomic van der Waals cohesive energy of Solid Argon are found. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Next the geometrical parameters a, c', 2c'=bond length, b, and e and energies due to the interatomic van der Waals cohesive energy of Solid Krypton are found. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Next the geometrical parameters a, c', 2c'=bond length, b, and e and energies due to the interatomic van der Waals cohesive energy of Solid Xenon are found. Also, the energies V_e, V_p, T, V_m, and E_{Total} are found for the molecule.

Calculation

I have verified that Equations 16.6-16.12 are true.

I have verified that Equations 16.13-16.14 and their values are also correct.

I have verified that all entries in Table 16.13 are correct.

I have verified that every entry in Table 16.14 is correct.

Also every entry in Table 16.15 is correct and has been verified by myself.

Every entry from V_e down have been verified by me to be correct in Table 16.16.

I have verified that every entry in Table 16.20 are correct.

I have verified that Equation 16.58 and Equation 16.59 plus its value are indeed correct.

I have verified that Equations 16.60 and 16.61 plus their values are correct. These compare very well to the experimental H bond distance.

I have verified that Equations 16.64-16.66 and their values are correct as listed. There is very good agreement with experimental nearest neighbor separation from Eqn. 16.66.

I have verified that all entries in Table 16.21 are correct.

I have verified that Equations 16.68-16.69 are also valid and correct.

I have verified that all calculated entries in Table 16.22 are correct.

I have verified that Equations 16.70-16.72 are correct as listed. The value from Eqn. 16.72 compares well with the experimental H-bond distance in the gas phase.

I have verified that Equations 16.74-16.76 are correct as listed. The value from Eqn. 16.76 compares well with the experimental nearest neighbor separation $2c'_{N\text{-}HO}$.

I have verified that Equation 16.78 and its value is correct.

In Table 16.23, I have verified that all entries are correct.

I have verified as correct all entries in Table 16.24.

I have verified as correct the Equations 16.80-16.82.

I have verified as correct all calculated entries in Table 16.25.

I have also verified as correct the Equations 16.83-16.86 and their values. There is very good agreement between the value from Eqn. 16.86 and the experimental graphite interplane distance.

I have also verified as correct the Equations 16.88-16.92 and their values. There is very good agreement between the value from Eqn. 16.92 and the experimental van der Waals energy per carbon atom.

I have verified that all values in Table 16.26 are correct.

I have verified that Equations 16.94-16.98 and their values are correct.

I have verified that all entries in Table 16.27 are correct.

I have shown that all calculated entries in Table 16.28 are correct.

I have demonstrated that Equations 16.99-16.102 and their values are correct. There is very good agreement between the value from Eqn. 16.102 and the experimental helium interatomic distance.

I have demonstrated that Equations 16.105-16.106 and their values are correct. There is very good agreement between the value from Eqn. 16.106 and the experimental van der Waals energy and roton energy.

I have verified that all the values in Table 16.29 are correct.

I have shown that Equations 16.109-16.113 and their values are indeed correct.

And I have shown that all values in Table 16.30 are correct.

I have shown that all calculated entries in Table 16.31 are correct.

I have verified that Equations 16.114-117 and their values are correct.

I have shown that Equations 16.119-16.120 and their values are correct.

I have verified that all the entries in Table 16.32 are correct.

I have verified that Equations 16.124-16.127 are correct.

And I have shown that all the calculated entries are correct in Table 16.34.

I have verified that Equations 16.130-16.133, 16.135-16.136, and 16.138 and their values are indeed correct.

I have verified that all entries in Table 16.35 are correct.

I have shown that Equations 16. 149-16.143 and 16.145 and their values are correct.

I have shown that Equations 16.147-149 and 16.151-16.152 and their values are correct.

I have verified that all entries in Table 16.38 are correct.

I have verified that Equations 16.156-16.159 and their values are correct.

I have also verified that Equations 16.161-16.165 and 16.167-16.168 and their values are correct.

I have verified that all the entries in Table 16.41 are indeed correct.

Conclusion

I was able to verify the GUTCP results of Chapter 16 in excellent agreement with my own calculations. I successfully reproduced almost all of the equations and their corresponding values found in Chapter 16. I verified that all entries in Tables 16.13, 16.14, 16.15, 16.16, 16.20, 16.21, 16.22, 16.23, 16.24, 16.25, 16.26, 16.27, 16.28, 16.29, 16.30, 16.31, 16.32, 16.34, 16.35, 16.38, and 16.41 are indeed correct.
This chapter demonstrates that the GUTCP theory is successful at describing NaH, H_2O in vapor phase, H_2O and NH_3, Graphite, Liquid Helium, Solid Neon, Solid Argon, Solid Krypton, and Solid Xenon, to a high degree of accuracy.

I find my results and calculations to be confirmation that the calculations and equations of Chapter 16 are indeed accurate, valid, and reproducible.