Report on the Evaluation of Chapter 5 in "The Grand Unified Theory of Classical Physics" by Dr. Randell L. Mills

Prepared by

Randy A. Booker, Ph.D.
57 Azalea Drive
Weaverville, NC 28787
(828) 251-6269
Booker@unca.edu

January 8, 2018
Revised December 3, 2018

Executive Summary

In my analysis, I verified calculated values involving hydrinos found in Chapter 5 of the book "The Grand Unified Theory of Classical Quantum Physics" by Dr. Randell L. Mills. I was able to verify all of the values found in Tables 5.1 and 5.2. I successfully verified the values for the Potential listed in Figures 5.1 and 5.2. I also replicated and verified several calculated values and equations throughout the chapter. In the course of these calculations for Chapter 5, I replicated his values and calculations to a very high degree of accuracy and found them to be correct.

Purpose

The physics being described in this chapter is that of newly-predicted lower-lying levels in the hydrogen atom. In the presence of a suitable catalyst - one with a net enthalpy of reaction of m(27.2) eV, where m is an integer - a hydrogen atom can release energy to the catalyst through a non-radiative process. This causes the hydrogen atom to drop into an energy level that lies below the ground state n=1 level of hydrogen. This new state of hydrogen is called a hydrino. It is characterized by having fractional values of n, where n = ½, ⅓, ¼, …, 1/p, where $p \leq 137$. This process of producing hydrinos is known as the Blacklight Process. We say that the catalyst is a source of an energy hole.

This is a very bold and revolutionary theory. The accepted theory of quantum mechanics says that the lowest-lying energy state in hydrogen is the ground state (n=1) and that no lower-lying states exist below the ground state. However I have seen first-hand evidence of the existence of hydrinos and the excess energy they give off when they form from hydrogen in the presence of these catalysts. I have visited Brilliant Light Power several times from May 2005-May 2015, and observed many experiments showing the existence of hydrinos and the excess power they give off when they form out of hydrogen in the presence of a catalyst. I have written up my findings in a series of technical reports during this ten-year period, and have seen that laboratory evidence points to the fact that hydrinos do exist.

During the formation of the hydrino, the radius of the hydrogen atom atomic orbital decreases from a_H to $a_H/(m+1)$. These decreasing atomic orbital radii are shown graphically in Figure 5.2 for energy hole absorption.

Once a catalytic transition occurs from n=1 to n=1/2, then further catalytic transitions may occur from n=1/2 to 1/3, 1/3 to ¼, ¼ to 1/5, and so on. That is, once catalysis begins, hydrinos can further autocatalyze in a process called Disproportionation. A list of hydrogen catalysts capable of supplying a net enthalpy of m(27.2) eV, where m is an integer, are given in Table 5.2.

Next, Dr. Mills gives examples of transition reactions involving potassium metal, helium ions, the NaH molecule, the H_2O molecule, argon ions, plus other examples. Here Dr.

Mills writes out the catalysis reactions and the energies given off in each one. Next he gives examples of disproportionation reactions where hydrinos can act as the source of the energy hole, since each of the energy levels of a hydrino atom is given by m(27.2) eV, where m is an integer. Again he writes out the reactions involved and calculates the energies given off in each example. He makes connections of disproportionation reactions to the dark matter problem.

Next, he calculates the interstellar disproportionation rate and the power generated by this process. He also discusses Hydrino Catalyzed Fusion (HCF). In HCF, as the atomic orbital shrinks with transitions down to energy states that lie lower in energy than the ground state, the two nuclei of the corresponding molecule formed from two atoms in such states can get much closer than they normally do. This makes it more probable that fusion can occur between the two nuclei. How small can this internuclear distance be? This depends on the new “ground” state found in the hydrino atom. The smallest atomic orbital and the lowest-lying level are determined due to the limiting speed, which is the speed of light. This places a limit on the quantity p. Dr. Mills finds that $p \leq 137$.

Dr. Mills also calculates the energies of the Molecular Blacklight Process. In Figure 5.5 he tabulates the size of hydrogen-type molecules as a function of total energy. He gives three examples of catalytic energy holes for hydrogen-type molecules, looking at examples of Iron, Scandium, and Gallium/Iron. Again he writes out the reactions involved and calculates the energies given off in each example.

Calculation

I have verified all of the Potential energies given in Figures 5.1 and 5.2. The values given are consistent with Dr. Mills’ theory.

In Table 5.1, my calculations agree exactly with all of the CP results of the R, Z_{eff}, and Energy Hole columns. To reproduce the values in the V column, I had to use the equation $27.21eV/n^2$, although the value for the numerator from Table 1.2 would yield 27.196eV, rather than 27.21eV. Once I used 27.21eV for the numerator, I reproduced all of the values in the V column. I also reproduced all the values for the T and Binding Energy columns (here I used T = |V|/2 and Binding Energy = T).

I am happy to report that I meticulously repeated all of the calculations involved in Table 5.2 and that all of my values exactly agree with Dr. Mills’ values. This is an important table to verify since it lists the possible catalysts that can form hydrinos.

I verified that equations 5.1-5.6 and 5.9 were correct. In Eqn. (5.12), I verified the values listed of 29.9 ppm and 1.59×10^{-3} ppm were correct. I showed that eqns. 5.16 and 5.18 are correct.

I verified that all the entries in Table 5.1 were correct. And I showed that all the values in Figure 5.2 were correct, too.

I showed that eqns. 5.29 - 5.35 are correct as written.

I verified that all the values listed in Table 5.2 are correct.

I verified that eqns. 5.37, 5.38, 5.40-5.45, and 5.48-5.51 are correct.

I verified that eqns. 5.53-5.61 were correct.

I verified that 55.4 eV gives a 22.8 nm cut-off on page 217, in the 5th line below eqn. (5.51).

I verified that 122.4 eV gives a 10.1 nm cut-off on page 218, in the 2nd line below eqn. (5.56).

I verified that 13.6 eV gives a 91.2 nm cut-off on page 219, in the 1st line below eqn. (5.61).

I verified that eqns. 5.62–5.72 were correct, as were eqns. 5.74 and 5.75.

I verified that eqns. 5.76-5.79 were right. And I verified the E part of eqn. 5.80.

I verified that 3481.6 eV gives 0.35625 nm on page 222, in the 2nd line below eqn. (5.80).

I verified that eqns. 5.81, 5.82, 5.88, and 5.89 are right. In Eqn. (5.91) I verified that the value stated is correct.

I verified that eqns. 5.95-5.100 are, indeed, correct.

I showed that eqns. 5.101, 5.102, 5.106, 5.108, 5.109, and the value stated in Eqn. (5.111) are correct.

I verified that eqns. 5.119, the value in eqn. 5.121, the value in eqn. 5.122, and eqns. 5.123-5.125 are correct.

Lastly, I verified that eqns. 5.127-5.135 are correct.

Conclusion

I was able to verify the CP results of Chapter 5 in very good to excellent agreement with my own calculations. I was able to replicate the derivation of Dr. Mills' equations to an excellent degree of accuracy and to confirm many of his calculated values. I successfully verified the values for the Potential listed in Figures 5.1 and 5.2, and was able to verify all of the values found in Tables 5.1 and 5.2. I find these results, overall, to be confirmation that the calculations included in Chapter 5 are both valid and reproducible.