On the Source of the Systematic Errors in the Quatum Mechanical Calculation of the Superheavy Elements

Albert Khazan
E-mail: albkhazan@gmail.com

It is shown that only the hyperbolic law of the Periodic Table of Elements allows the exact calculation for the atomic masses. The reference data of Periods 8 and 9 manifest a systematic error in the computer software applied to such a calculation (this systematic error increases with the number of the elements in the Table).

Most scientists who worked on the problems of the Periodic Table of Elements (G. T. Seaborg, J. T. Bloom, V. I. Goldanskii, F. W. Giacobbe, M. R. Kibler, J. A. Rihani et al.) attempted to construct new models of the Table with the use of quantum mechanical calculations. In this process, they used a complicate mathematical apparatus of Quantum Mechanics, and introduced additional conditions such as the periods, the number of the elements, and so on. In other word, they first set up a problem of introducing Periods 8 and 9 into the Table of Elements (50 elements in each), and predict the respective interior of the cells of the Table and the interior of the atoms. Only then, on the basis of the above data, they calculate the atomic mass and the number of the neutrons. However the main task — obtaining the exact numerical values of the atomic mass, corresponding to the numbers of the elements higher than period 8 — remains unsolved.

The core of my method for the calculation is the law of hyperbolas discovered in the Periodic Table [1]. Using the law, we first calculated the atomic mass of the upper (heaviest) element allowed in the Periodic Table (411.663243), then its number (155) was also calculated. According to the study [1], this element should be located in Group 1 of Period 8. The main parameters of the chemical elements were obtained in our study proceeding from the known data about the elements, not from the suggestions and the use of the laws specific to the microscale.

Figure 1 in Page 67 shows two dependencies. The first is based on the IUPAC 2007 data for elements 80–118 (line 1). The second continues upto element 224 (line 2). As is seen, there is a large deviation of the data in the section of the numbers 104–118. This is obviously due to the artificial synthesis of the elements, where the products o the nuclear reactions were not measured with necessary precision. Line 2 is strictly straight in all its length except those braking sections where it is shifted up along the ordinate axis. Is is easy to see that at the end of line 1, in the numbers 116–118, the atomic mass experiences a shift for 17 units. These shifts increase their value with the number of the elements: the next shift rises the line up for 20 units, and the last shift — for 25 units. In order to find the numerical values of the shifts more precisely, Figure 2 was created (see Page 67): this is the same broken line (the initially data) compared to itself being averaged by the equation of the line of trend (whose data were compared to the initial data). Hence, the difference between these lines should give the truly deviation of the numerical values f the atomic masses between the FLW Inc. data and our data (our data deviate from the equation of the line of trend for nothing but only one hundredth of 1 atomic mass unit). Figure 3 in Page 68 shows a shift of the atomic mass just element 104, before Period 8: in element 118 the atomic mass is shifted for 11 units; in Period 9 the shift exceeds 15 units, and then it increases upto 21 units. The respective data for Period 8 are shown in Figure 4.

These data lead to only a single conclusion. Any software application, which targets the quantum mechanical calculation for the atomic mass of the elements, and is constructed according to the suggested law specific to the microscale, not the known data about the chemical elements, will make errors in the calculation. The theory [1] referred herein manifested its correctness in many publications, and met no one negative review.

Submitted on July 06, 2010 / Accepted on July 12, 2010

References

1. Khazan A. Upper limit in Mendeleev's Periodic Table — Element No.155. 2nd expanded edition, Svenska fysikarkivet, Stockholm, 2010.

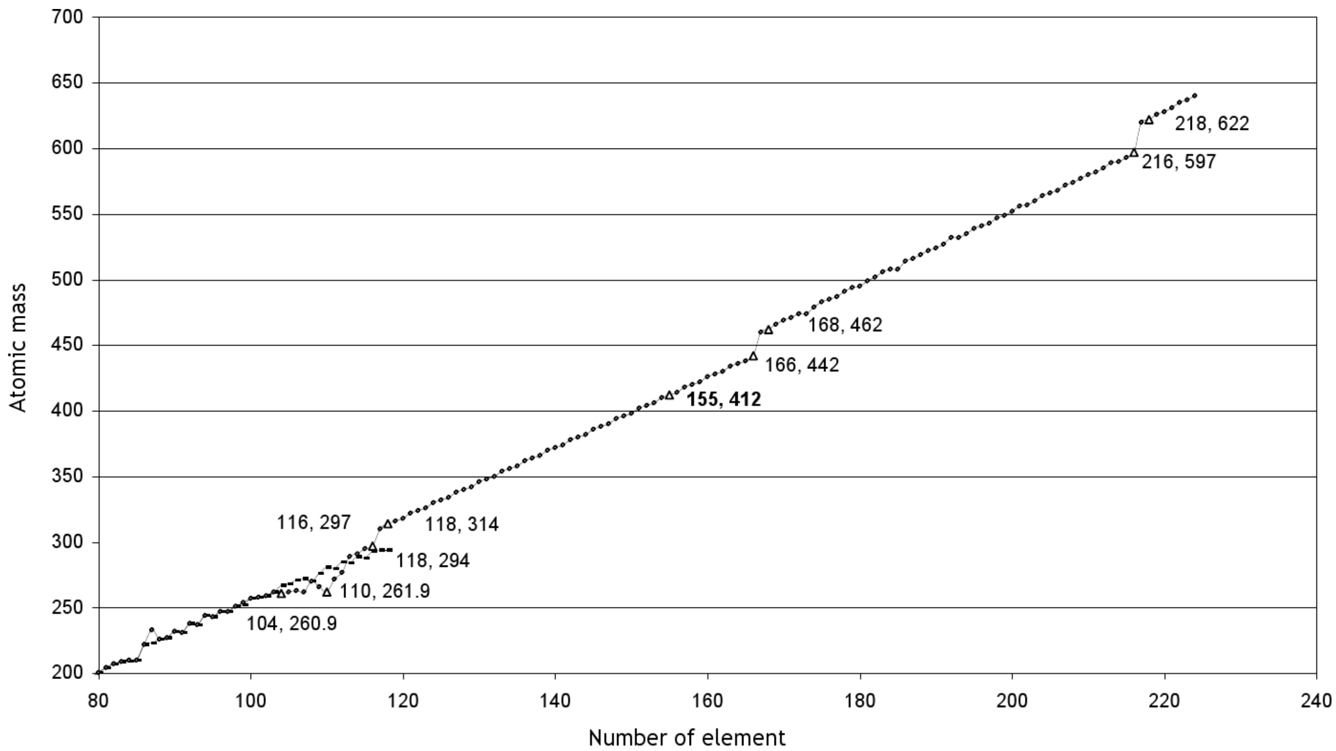

Fig. 1: Dependency between the atomic mass of the elements and their number in the Table of Elements. The IUPAC data and the FLW Inc. data begin from number 80, for more visibility of the dependency.

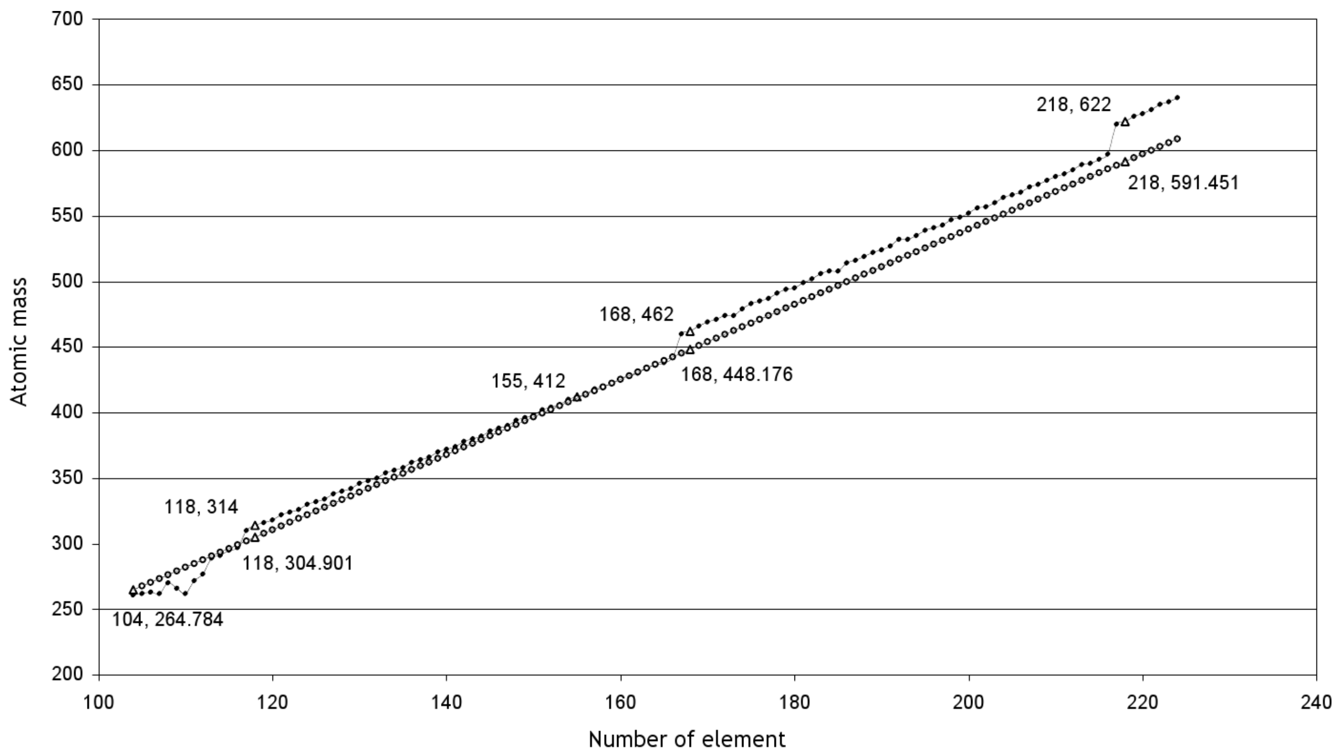

Fig. 2: Dependency between the atomic mass of the elements and their number in the Table of Elements. Black dots are the FLW Inc. data. Small circles — the averaged results according to the FLW Inc. data.

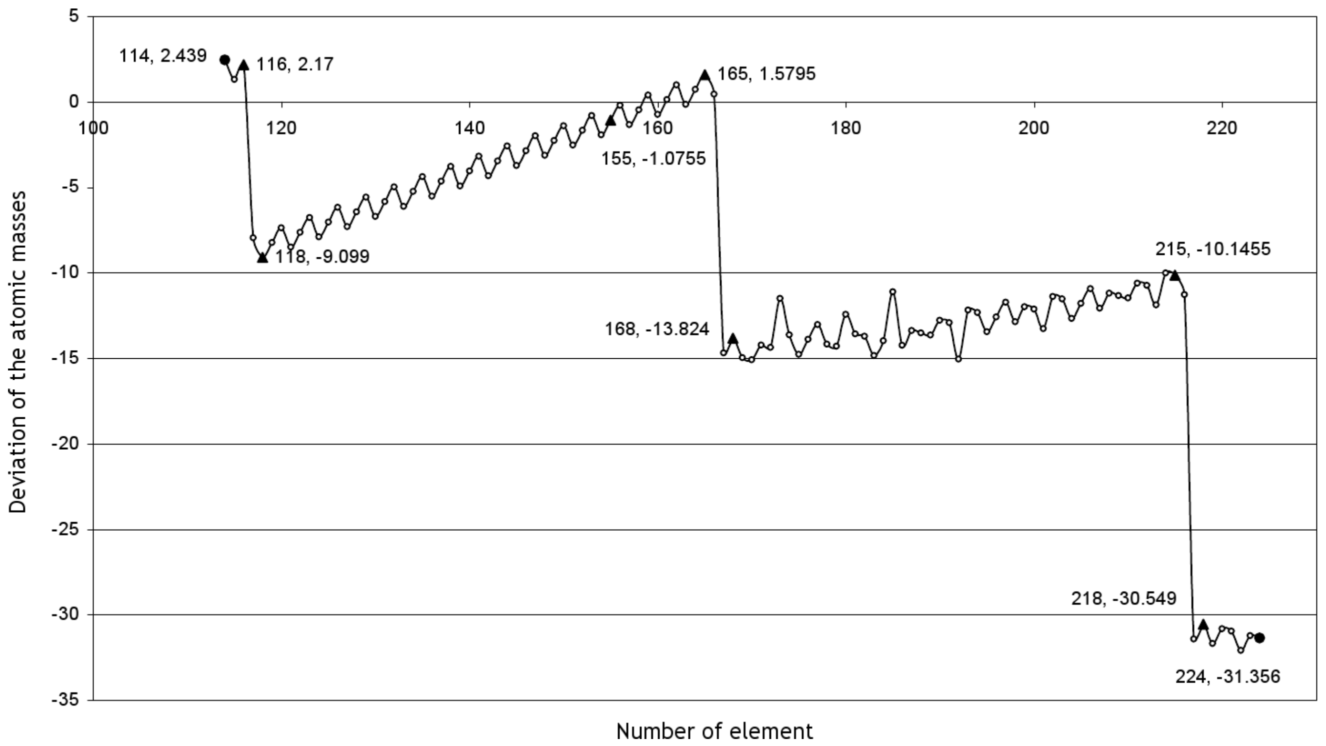

Fig. 3: Dependency between the atomic mass, calculated according to our theory and the FLW Inc. data, and their number in the Table of Elements.

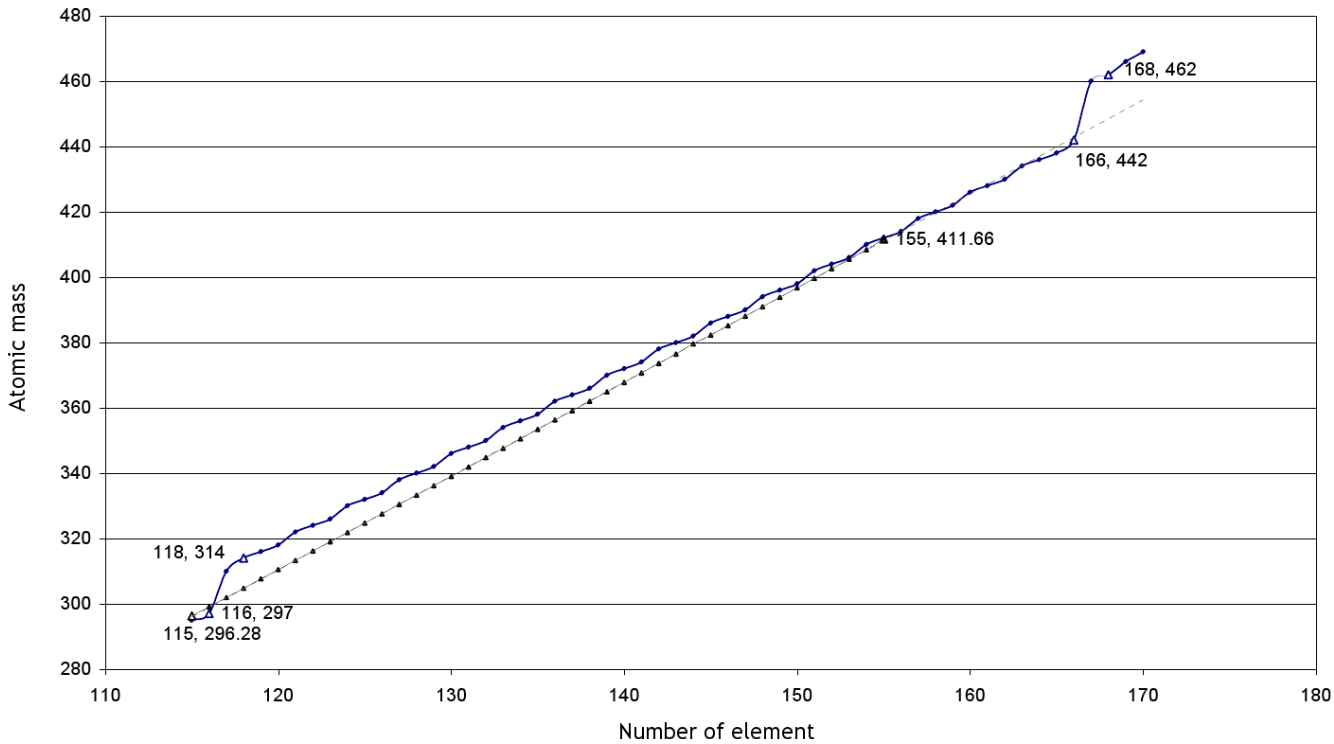

Fig. 4: Dependency between the atomic mass of the elements and their number in the Table of Elements, shown for Period 8. Black dots are the FLW Inc. data. Small triangles — the data according to our calculations.