

## On the Geometry of the Periodic Table of Elements

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The presented analytical research manifests a geometrical connexion existing among the elements of the Periodic Table of Elements, in addition to the known physical chemical connexion.

Despite the spectacular versions of the periodic tables of elements were suggested by the scientists, no one person did not state the following problem: how the elements are geometrically connected among each other in the groups and periods? As is known, the elements are located in the cells, which are joined into 18 groups along the vertical axis in the Table of Elements, and into 7 periods (I suggested recently that 8 periods, see [1] and references therein) along the horizontal axis. Number of the elements rises from left to right in the periods, and from up to down in the groups. The periods begin with the elements of Group 1, and end with the elements of Group 18. Each column determines the main physical chemical properties of the elements, which change both from up to down and from left to right. For example, the elements of Group 1 are alkaline metals (the very active chemical elements), while Group 18 consists of inert gases which manifest a very low chemical activity under the regular physical conditions. In the end of the 20th century, IUPAC suggested a long period form of the Table of Elements, where Period 1 consists of 2 elements, Periods 2 and 3 consist of 8 elements in each, Periods 4 and 5 consist of 18 elements in each, while Periods 6 and 7 consist of 32 elements in each. Finally, Period 8 consisting of 37 elements was suggested on the basis of my theoretical studies [1].

This short study targets a search for the geometrical connexion among the elements of the Periodic Table.

Figure 1 in Page 65 shows that the elements of Group 18 are concentrated along the upper broken line, which is split into three straight lines joining three elements (four elements in the end) in each. The numbers indicate the periods and elements. Period 8, containing element No.155, is also shown here. Each straight section of these can easily be described by a straight line equation.

The lower broken line presents Group 1 (as seen according to the numbers of the elements). The space between the upper and lower straight lines is filled with the straight line of Group 13. It consists of Periods 2–4, 4–6, and 6–8 (Period 1 was omitted from the graph for simplicity). Besides, the points 6,67; 6,81; and 7, 99 which are related to actinides and lanthanides are shown inside the boundaries. Hence, we can suppose that the plane bounded by the lines of Group 1 and Group 18, and also by the points 8,155 and 8,119 on right and the points 1,2; 1,1 on left (and 2,3 of course) contains all known and unknown elements of the Periodic Table. Thus,

this figure obtained as a result of the purely geometrical constructions, allows us to make the following conclusions:

- The Periodic Table should necessary contain Period 8, which begins with No.119 and ends by No.155;
- No elements can exist outside this figure;
- A strong geometrical connexion exists among the groups and periods.

Thus, this short study hints at a geometrical connection among the elements of the Table of Elements, which exists in addition to the known physical chemical properties of the elements. Note that the geometrical connexion manifests itself per se in the study, without any additional suggestions or constructions. Therefore, this does not change the form of the Periodic Table of Elements, which remains the same.

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### References

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

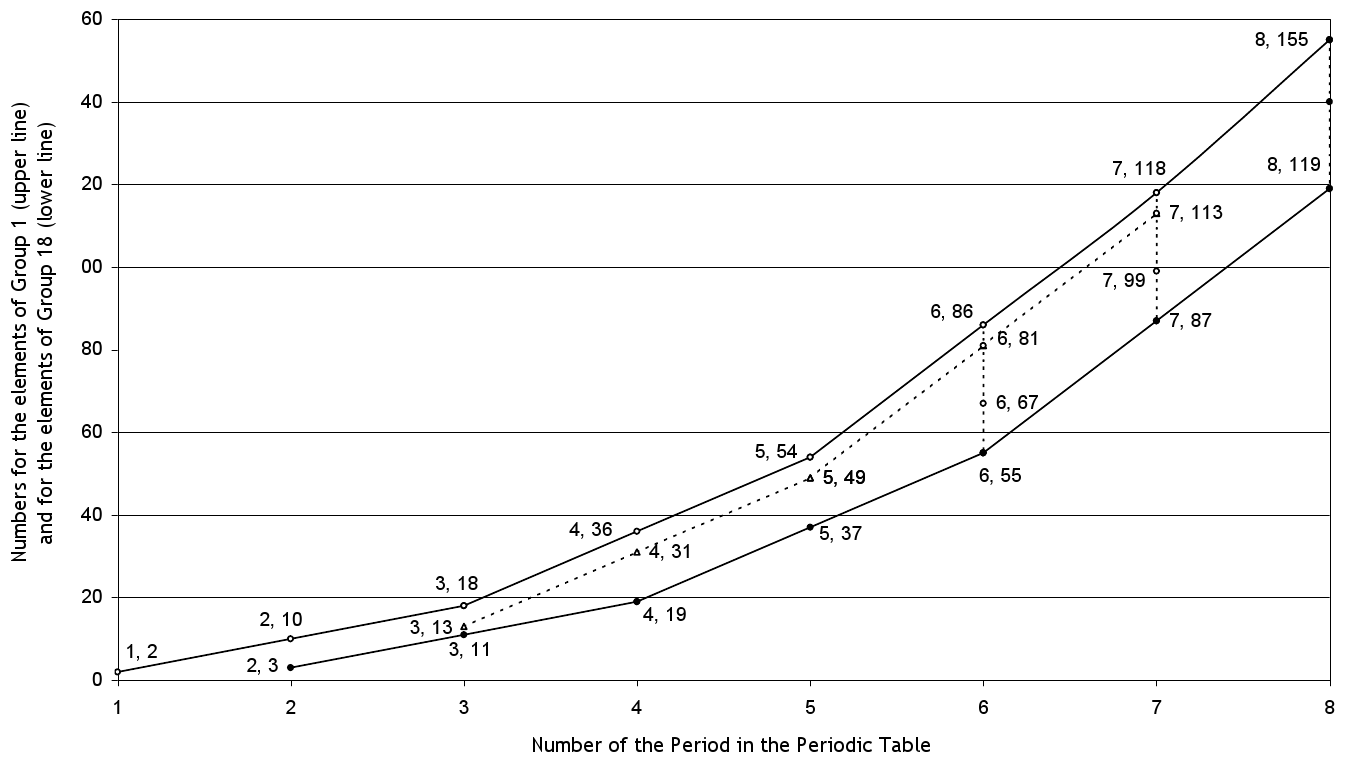


Fig. 1: Locations of the elements opening the Periods (the lower line) and those closing the Periods (the upper line).