

# Chemistry: New Periodic Table of The Elements

<a href="#">Werner Table</a>	<a href="#">D. Mendelejev</a>	<a href="#">Periodic Table and atomic structure (PL)</a>	<b>NEW TABLE</b>	<a href="#">1To 168 elements</a>	<a href="#">Questions</a>	<a href="#">Home</a>
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This is a New Periodic Table of the Elements

name element	atomic number	atomic weight	group number and [oxidation state]	periodic number and elektron configuration	chemical character	melting point [C]	boiling point [C]
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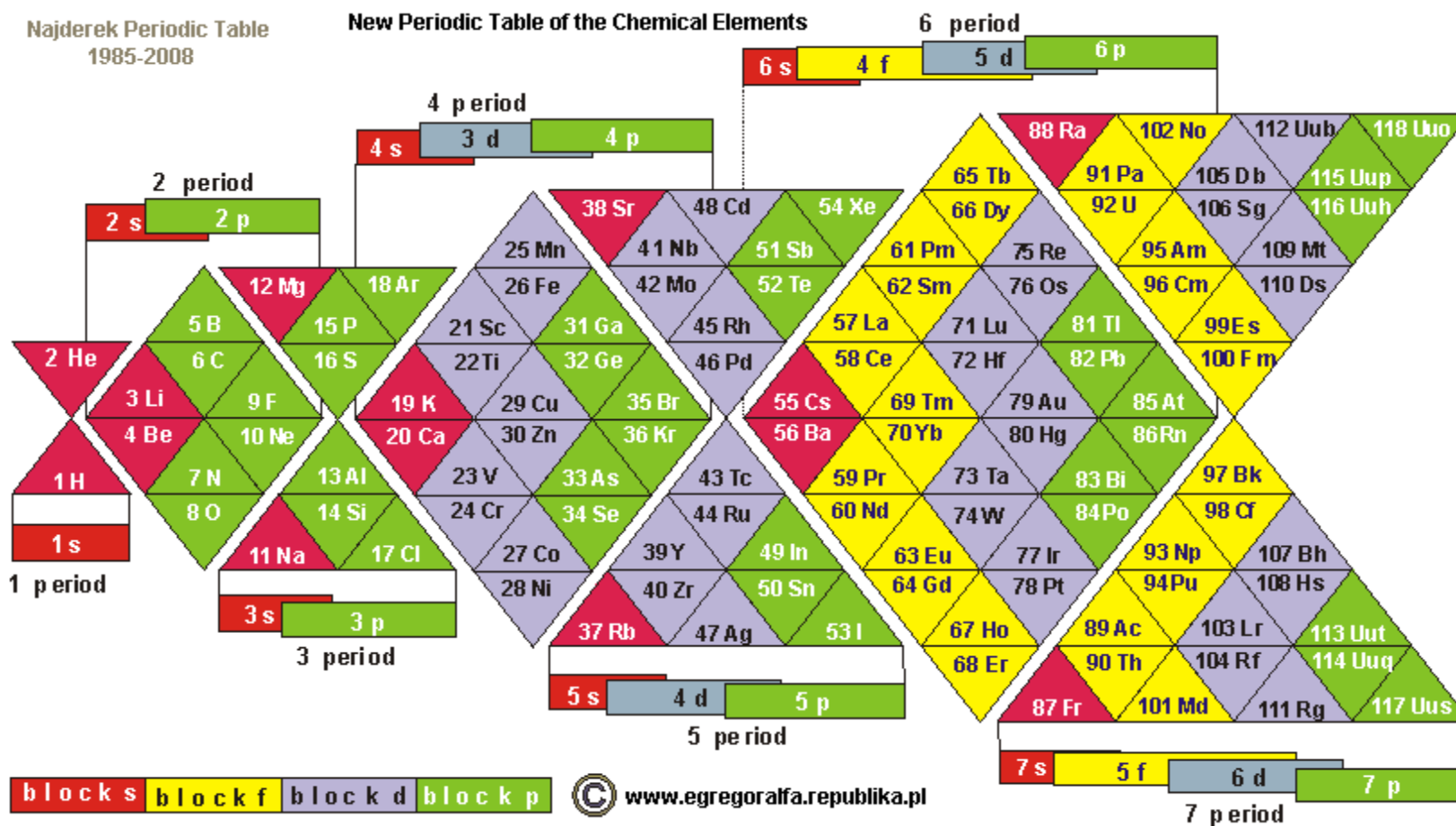
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Bydgoszcz dn.13.03.2008

[What are the advantages of this Periodic Arrangement?](#)

[image with Hydrogen in the group VIIA \(17\)](#)

[The distribution of electrons in atoms and ionization energies >](#)



The figure displays no groups of the periodic table of the chemical elements. Therefore, we provide a table with links to figures with their presentation below.

### Groups of the Periodic Table of the Chemical Elements

[links to images groups:](#)

↓  
temp. group IIIC

block s		block f	block d										block p					
IA	IIA	IIIC	IIIB	IVB	VB	VIB	VII B	VIII B	VIII B	VIII B	IB	IIB	IIIA	IVA	VA	VIA	VIIA	VIIIA
<u>1</u>	<u>2</u>	<u>3C</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>

#### Remarks

There are 7 periods in the periodic table of the chemical elements displayed above, as in alternative tables. The advantage of this table is the arrangement of periods, which generally does not limit the number of elements or the number of periods. Theoretically, the number of periods is unlimited, unless there is an unknown principle preventing the addition of new ones to the TABLE. So far, there are slightly over a hundred chemical elements, and only few atoms of the last one (118 Uuo) have been synthesized. The chemical element 117 Uus has not yet been discovered (synthesized), but we can assume its location in the periodic table.

The number of chemical elements in each period is defined by the equation:

$$2 \sum_{0}^{n-1} (2l+1) = 2n^2$$

and amounts to:

**2** for period 1, **8** for periods 2 and 3, **18** for periods 4 and 5, and **32** for periods 6 and 7. Will this principle also be valid for periods 8 and 9, and will they have 50 elements each in a period?

It is easy to see that the layouts of double periods are different. If we analyze the example of periods 6 and 7 (with 32 chemical elements each), and outline period 6 as two triangles connected with bases, then period 7 can be outlined as the same two triangles but connected by their vertices. If we replace these triangles in period 7 with each other, then the obtained period 7 will be identical to period 6. Also, the division of periods into groups will be clearer. The arrangement of table elements and its geometrical structure results from the need to ensure that the table has maximum differentiation and the lowest possible energy.

[Animated image with periods 6 and 7](#)

### What are the advantages of this table?

1. The table follows the theoretical principles of quantum chemistry.
2. The table has an open and condensed structure, because any number of chemical elements can be incorporated, and **f-block** elements (lanthanides and actinides) are listed in their periods (6 and 7) and there is no need to list them in separate tables outside periods.
3. Each period corresponds with an electron shell and a quantum number 'n', which determines the number of chemical elements in a particular shell according to the formula:  $2n^2$ . The number of shells in each period is equal to the principal quantum number 'n'. The number of chemical elements in a sub-shell of an individual period is determined by a formula and depends on the azimuthal quantum number l, which can have the value of 0,1,2,3,4. The number of elements in a sub-shell (block) of the table is defined from the equation:  $2(2l+1)$  where  $l=n-1$

period	block s	block f	block d	block p	the sum of elements
1	2	-	-	-	2
2	2	-	-	6	8
3	2	-	-	6	8
4	2	-	10	6	18
5	2	-	10	6	18
6	2	14	10	6	32
7	2	14	10	6	32

4. Orbitals can be identified in each sub-shell or block (*as in the structure of electron orbitals in atoms*) which incorporate two chemical elements. This is reflected in the figure by two triangles (*denoting chemical elements*) connected by their bases or vertices (analogy to spin – they have opposite orientations).

A question remains whether or not the presence of 3 double periods (with the same number of chemical elements), i.e. 2 and 3, 4 and 5, and 6 and 7 is a principle here or a distortion resulting from mutual interactions between electrons?

#### **Pauli exclusion principle:**

**No two electrons can occupy the same orbital unless they have opposite spins.**

5. The periodic table has been designed to achieve maximum differentiation in the location of chemical elements, but

simultaneously to obtain its minimum energy, which is reflected in the arrangement of double periods. In fact, there are no differences and this was demonstrated based on the [example displayed in the figure](#).

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### **\*Group IIIC**

A minor problem concerns the group denoted IIIC. This group lists chemical elements known as lanthanides and actinides, including Lanthanum and Actinium. This group covers **2\*14 =28 elements in periods 6 and 7** of the periodic table. In the figure displaying the proposed periodic table in question the problem seems not to exist. However, the existing and accepted division into groups within the periodic table seems to be insufficient, because the elements are named lanthanides and actinides, without denoting them with an individual group number as is done with other chemical elements. This probably results from the fact that these elements demonstrate higher similarity within the period than within the group. Each lanthanide has a corresponding actinide element listed below it in the table, but the differences are much more considerable than differences resulting from the similarities of subsequent lanthanide elements within the period.

Listing individual elements in individual groups describes the principal properties of each chemical element, i.e. its principal valency. All lanthanides and actinides were listed to f-block, but the official approach concerning this fact is slightly different: **Lanthanum, Actinium and Thorium are listed in d-block, and Lutetium and Lawrencium to f-block.**

Elements from the **Lanthanum** group (*including Lanthanum*) create trivalent cations and have properties typical of metals. Apart from trivalent properties for chemical elements from the entire group, there are also elements demonstrating other valency numbers: **Sm<sup>+2</sup>, Eu<sup>+2</sup>, Tm<sup>+2</sup>, Yb<sup>+2</sup> Ce<sup>+4</sup>, Pr<sup>+4</sup>, Tb<sup>+4</sup>** .

Elements from the **Actinium** group (*including Actinium*) except two (**Th and Pa**) are also trivalent, the same as lanthanides. Elements from this group with other valency numbers include: **Md and No: (+2); Th, Pa, U, Np, Pu, Am, Cm: (+4); Pa, U, Np, Pu, Am: (+5); U, Np, Pu, Am: (+6).**

In the above periodic table elements from f-block (*lanthanides and actinides*) are classified to **group IIIC**, which is also (as in alternative tables) an unsatisfactory solution. It seems that a more detailed division into groups for these elements should exist, but this would require adding subsequent groups to the periodic table. Such an addition is possible in this periodic table, but as yet there are no data from experimental studies to support such a solution. Unfortunately, this operation cannot be successfully performed so far.

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[links:](#)

<http://old.iupac.org/general/FAQs/elements.html>

<http://www.geocities.com/rihanij/classicblue.html>

<http://www.apsidium.com/>

<http://www.webelements.com/>

[http://www.meta-synthesis.com/webbook/35\\_pt/pt.html](http://www.meta-synthesis.com/webbook/35_pt/pt.html)

<http://www.theodoregray.com/>

- IUPAC

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