nucleus and the electrons stay at the same level of the main external energy.

رتب العناصر التالية حسب زيادة طاقة التأين

H.W ^{4}Be, ^{12}Mg, ^{20}Ca

^{4}Be $1s^2 2s^2$

^{12}Mg $1s^2 2s^2 2p^6 3s^2$ حسب الزمر

^{20}Ca $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

من الاسفل الى الاعلى تزداد

$^{4}Be > {}^{12}Mg > {}^{20}Ca$

^{13}Al, ^{14}Si, ^{16}S

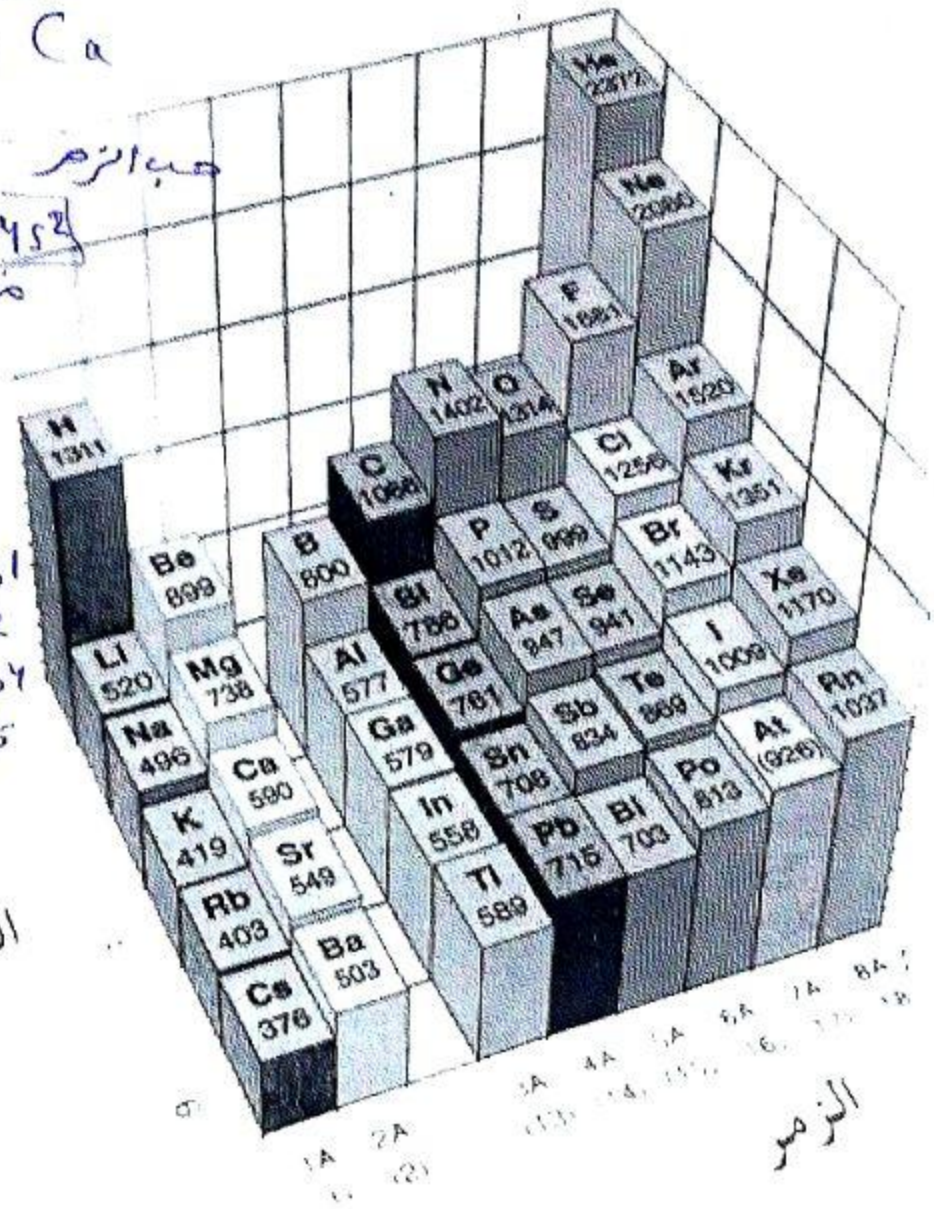
^{13}Al $1s^2 2s^2 2p^6 3s^2 3p^1$

^{14}Si $1s^2 2s^2 2p^6 3s^2 3p^2$

^{16}S $1s^2 2s^2 2p^6 3s^2 3p^4$

حسب الدورات

$^{16}S > {}^{14}Si > {}^{13}Al$ تزداد



استثناء

An exception to this increase is that if the atom has a saturated secondary shell such as ns^2 or half saturated like np^3, its ionization energy is greater than the ionization energy of the atom after which ^{7}N is the largest ionization energy of ^{8}O despite of the oxygen atom is the largest atomic number of the nitrogen atom , They fall into one period. Noble elements possess the highest ionizing energy because they do not lose their electrons easily.

نلاحظ بان كل Be, N لهما طاقة تأين اعلى من الموقع

^{3}Li ^{4}Be ^{5}B ^{6}C ^{7}N ^{8}O ^{9}F ^{10}Ne

5.4 9.3 8.3 11.3 14.5 13.6 17.4 21.6

يتبع الترتيب الالكتروني حيث يصبح الغلاف الخارجي بوضع مستقر

^{4}Be $1s^2 2s^2$ مشبع وفائض $2p^0$

^{7}N $1s^2 2s^2$ مشبع ونصف مشبع $2p^3$

تزداد طاقة التأين

3- Electron Affinity

Electronic affinity are defined as the ability of a gas-neutral atom to accept a single electron and release a measure of energy, as in the fluorine atom.

F > O > ....

$$F + \tilde{e} \longrightarrow F^- + \text{energy}$$

Li > Na > ....

Increasing the electronic affinity of the elements in the periods increase the atomic number, either in the elements of the group one, it becomes more difficult to add the electron by increasing the atomic number of the element as the atomic number increased the difficulty of adding the electron. Noble element are considered

The least elements that have an electronic affinity because it is difficult to add electrons to it.

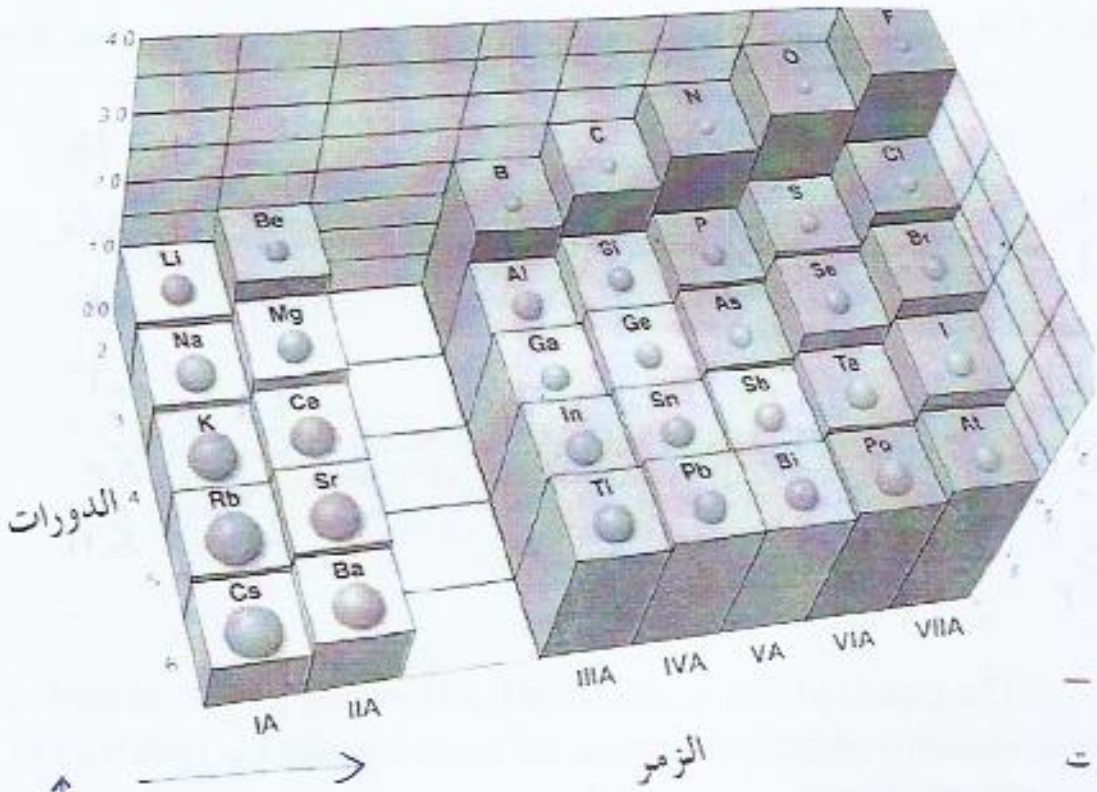
4-Electronegativity

In many compounds, the negative charge of the bonding electrons is concentrated near a specific atom, which greatly affects the chemical properties of the compound. The electrolysis is defined as the ability of the atom to attract the electrons of the bond towards it in any chemical compound. Since fluorine is the highest electrolyte element, For the electrolyte, these values were determined for the other elements as measured by the fluorine electrolyte,

The electronegativity increases as the atomic number increases in the period with some exceptions, while the group decreases as the atomic number increases.

For noble gases, it is considered abnormal because some of them are not compounds and therefore cannot be assigned to the

electronegativity, but when the noble gas compounds there is very high electronegativity.



السالبية الكهربائية مرتبطة بحجم الذرة فكلما صغر
حجم الذرة ازدادت السالبية الكهربائية
والذرة الصغيرة لها قوة جذب كبيرة للالكترونات

∴ الفلور - - - - - -

اما السيزيوم - - - - - -

The basic conditions for the composition of ionic compound

تكوين

1- Ionization energy is one of the elements and metals usually low, which loses one electron or more easily.

2 - The energy of electron affinity of the second element of the compound high in the meaning of accepted one or more electrons easily

						He
H						
Li	Be	B	- - - - -		F	Ne
Na	Mg	Al	- - - -		cl	Ar
k	Ca	Ga	- - - -		Br	kr
Rb	Sr	In	- - - - - -		I	Xe
Cs	Ba	Tl	- - - - -		At	Rn
Fr	Ra					

The metals of first group (alkali) and second group , as well as some elements of the third group, are candidates for the formation of positive ion in ionic compounds.

The second element of the electron is often Halogens as well as oxygen and to a lesser extent O^{-2} and S^{-2} and both parties acquired and losses seeks to achieve better stability in the process of accept and loss, such as RbCl, CsBr, MgO, $CaCl_2$, NaCl

يكون المجموع الجبري لاعداد التاكسد الموجبه والسالبه
في الصيغه الكيميائيه يساوي صفر

امثله :- اسماء المركبات	صيغتها الكيميائيه
بروميد المغنيسوم	$MgBr_2$
هيدروكسيد الباريوم	$Ba(OH)_2$
كاربونات الباريوم	
كبريتيد الهيدروجين	
فوسفات الكالسيوم	
اوكسيد الهيدروجين (الماء)	
اوكسيد الكالسيوم	
اوكسيد الالمنيوم	

H/W

Group I (1A)

Introduction

The study is easy if it's possible to classify elements of the periodic table into groups that are similar in properties because the process of studying each element in single is a difficult and stressful process.

تزداد الاحجام الذرية
وبالتالي تزداد تفاعلية

Element		Electronic structure
Lithium	^{3}Li	$^{2}[He]\ 2s^{1}$
Sodium	^{11}Na	$^{10}[Ne]\ 3s^{1}$
Potassium	^{19}K	$^{18}[Ar]\ 4s^{1}$
Rubidium	^{37}Rb	$^{36}[Kr]\ 5s^{1}$
Cesium	^{55}Cs	$^{54}[Xe]\ 6s^{1}$
Francium	^{87}Fr	$^{86}[Rn]\ 7s^{1}$

تقل طاقة التأين

الفلزات القلوية

The Alkali Metals

General properties

The element of the first group are called alkaloid metals because they produce alkaline solution when their reaction with water.

1. Contain one electron in their outer shell.
2. Posses highest atomic size so they possess lower ionization energy.
3. The monovalent cation possess the electronic structure of the noble gas.
4. They possess low density due to their large atomic size , so their m.p. and B.P. are low.
5. Their monovalent cation are diamagnetic and their compounds are colorless.
6. Very reactive due to low ionization energy and loss their brightness easily. So the chemistry of alkyl metal is the chemistry their ions.

7. React with water strong and the reactivity increase down=n the group producing very strong base which are the strongest bases known and they are water soluble except (LiOH) which is low soluble :

$$2M + H_2O \longrightarrow 2MOH + H_2 \uparrow$$

M = Alkali metal.

8. These element behave in the form of strong reduce agents (Tend to lose the electrons of the outer shell easily) easy to oxidize.

9. Increasing the effective of the elements as the atomic number increases, for example the cesium is considered the most effective, while lithium is the least effective.

The diagonal relation ships

The resembles in chemical and physical properties between the 1St element of each group and 2nd element of the neighboring group due to the polariziblity power which is expressed as ionic charge divided to ionic radius which is equal between the two elements .

I	II	III	IV
Li	Be	B	C
Na	Mg	Al	Si

Evidences diagonal relation between Li and Mg

1- Both react with air formation crystalline red solid compound (Nitrides), therefore Li and Mg are used to purity the gasses from nitrogen.لتنقية الغازات من النيتروجين

$$6Li + N_2 \longrightarrow 2Li_3N$$

$$3Mg + N_2 \longrightarrow Mg_3N_2$$

2- Due to the covalent nature Li and Mg alkyls are soluble in organic solvent.

Sodium (Na)

Atomic number = 11

Mass number = 23

$1s^2\ 2s^2\ 2p^6\ 3s^1$

العدد الذري = عدد البروتونات = عدد م

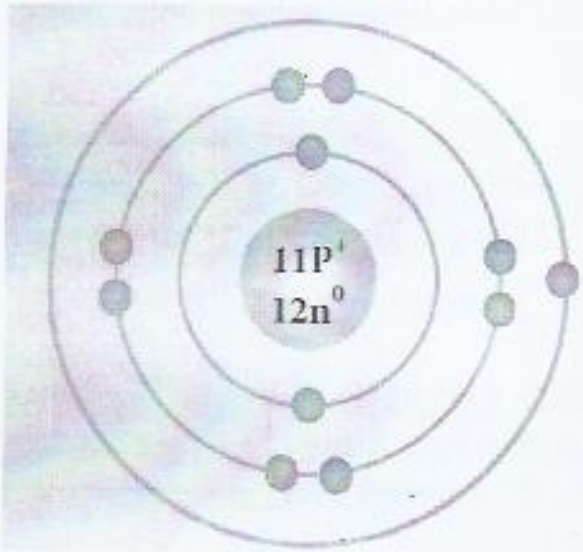
11 = 11

عدد N = عدد الكتلة - العدد الذري

11 - 23 =

12 =

عدد الالكترونات	رقم الغلاف(n)	رمز الغلاف
2	1	K
8	2	L
1	3	M



Chemical properties

There is no sodium free in nature because of its effectiveness and present united with other elements, consisting of fixed compounds Including sodium chloride, sulphates, silicates and others.

Sodium: reactions of elements

1.Reaction of sodium with air

Sodium is burnt in air the result is white sodium peroxide, Na_2O.

$$4Na(s) + O_2(g) \rightarrow 2Na_2O(s)$$