

H<sub>3</sub>C

CH<sub>3</sub>

CHEMISTRY

### **Periodic Classifications of Elements**

# s – block elements and p – block elements

C5H11



### **Periodic Table of Elements**



Periodic Law : Properties of the elements are a periodic function of their atomic number.

In the long form of **periodic table** elements are arranged in the increasing order of atomic no.



## **Periodic Table of Elements**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	1 <sup>1</sup> H Hydrogen 1.00794	Atomic # Symbol Name Atomic Mass	С	Solid				Metals			Nonme							2 <sup>2</sup> He Helium 4.002802	к
2	3 <sup>2</sup> Li Lithium 6.941	4 22 Be Beryllium 9.012182	Hg H	4		Alkali metals	Alkaline earth metals	Lanthanc	metals	Poor metals	Other nonmetals	Noble ga	5 3 B Boron 10.811	6 24 C Carbon 12.0107	7 28 N Nitrogen 14.0067	8 2 0 0 0xygen 15,9994	9 3 F Fluorine 18.9984032	10 2 Neon 20.1797	K
3	11 25 1 Na Sodium 22.95976928	12 § Mg Magnesium 24.3050	R	f Unknov	vn	stals	tals	Actinoids	3	n tals	<u>IS</u>	gases	13 23 Al Aluminium 26.9815386	14 23 Si Silicon 28.0855	15 28 P Phosphorus 30.973762	16 23 S Sulfur 32.085	17 29 CI Chilorine 35.453	18 Ar Argon 39.948	K M
4	19 28 K 1 Potassium 39.0963	20 28 Ca Caloium 40.078	21 \$ Sc \$2 Soandium 44.955912	22 <b>Ti</b> <sup>11</sup> <sup>11</sup> <sup>11</sup>	23 23 11 Vanadium 50.9415	24 28 Cr 13 Chromium 51.9901	25 Mn Manganese 54.938045	26 13 <b>Fe</b> 155.845	28 14 2 Cobalt 58.933195	28 Ni Nickel 55.0934	29 10 2 2 29 Cu Copper 03.540	30 28 <b>Zn</b> 28 Zino 05.38	31 28 Ga 33 Gallium 69.723	32 28 Ge Germanium 72.04	33 <sup>2</sup> As Arsenic 74.92160	34 38 Se 38 Selenium 78.96	35 28 Br 15 Bromine 79.904	36 Kr <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup>	KLMN
5	37 28 18 18 18 18 18 18 18 18 18 18 18 18 18	38 5 Sr 5 Strontium 87.62	39 ★ 18 9 Yttrium 88.90585	40 Zr	41 28 Nb 18 Niobium 92.90638	42 42 10 10 10 10 10 10 10 10 10 10 10 10 10	43 <b>Tc</b> Technetium (97.9072)	<sup>2</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>10</sup> <sup>101.07</sup>	45 <b>Rh</b> 102.90550	46 Pd Palladium 106.42	47 47 <b>Ag</b> Silver 107.8682	48 <b>Cd</b> Cadmium 112.411	49 2 10 18 10	50 2 <b>Sn</b> 18 118.710	51 2 <b>Sb</b> 18 Antimony 121.760	52 2 <b>Te</b> 18 Tellurium 127.60	53 2 53 1 10 10 12 53 15 15 15 15 15 15 15 15 15 15	54 28 Xe 18 Xenon 131.293	NUN
6	55 28 Cs 18 Caesium 1 132.9054519	56 2 Ba 18 Barium 137.327	57–71	72 Hf <sup>13</sup> Hafnium 178.49	73 28 <b>Ta</b> 180.94788	74 28 W 18 Tungsten 183.84	75 Re Rhenium 188.207	<sup>2</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>05</sup> <sup>0smium</sup> <sup>190.23</sup>	28 77 18 1 <b>r</b> 14 192.217	78 <b>Pt</b> 195.084	79 32 17 Gold 190.900509	80 28 80 18 82 82 82 82 82 82 82 83 83 82 83 83 82 83 83 82 83 83 82 83 83 83 83 83 83 83 83 83 83 83 83 83	81 2 <b>TI</b> 32 Thallium 204.3833	82 8 <b>Pb</b> 32 18 Lead 4 207.2	83 28 Bi 32 Bismuth 208.98040	84 2 <b>Po</b> 32 Polonium (208.9824)	85 28 At 32 Astatine (209.9871)	86 28 <b>Rn</b> 18 Radon (222.0176)	AOZZHA
7	87 28 Fr 18 Francium 1 (223) 1	88 2 <b>Ra</b> 32 Radium 2 (226)	89–103	104 Rf Rutherfordum (281)	105 28 105 18 105 18 18 105 18 18 12 11 12 12 105 18 12 12 12 12 12 12 12 12 12 12	106 Sg Seaborgium (286)	107 Bh Bohrium (264)	<sup>2</sup> <sup>18</sup> <sup>18</sup> <sup>322</sup> <sup>13</sup> <sup>13</sup> <sup>13</sup> <sup>13</sup> <sup>13</sup> <sup>13</sup> <sup>13</sup>	<sup>2</sup> <sup>18</sup> <sup>32</sup> <sup>32</sup> <sup>14</sup> <sup>14</sup> <sup>14</sup> <sup>14</sup> <sup>14</sup> <sup>16</sup> <sup>109</sup>	110 <b>DS</b> Darmstadtium (271)	111 18 32 32 32 17 Roentgenium (272)	112 <b>Uub</b> Ununbium (285) <b>112</b> 18 18 18 18 18 18 18 18 18 18	113 <b>Uut</b> Ununtrium (284) <sup>2</sup> <sup>18</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>32</sup> <sup>33</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> <sup>35</sup> 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					For elem	ents wit	h no st	able isot	opes, the	e mass	number	of the iso	tope wit	h the lon	gest hal	f-life is i	n parent	heses.	
					[	Design a	nd Interf	ace Copy	right © 19/	997 Mich	ael Dayah	(michael@	@dayah.c	om). http:	//www.pta	able.com/	,		
				57 La Lanthanum 138.90547	58 28 Ce 18 Cerium 22	59 28 Pr 28 Praseodymium 29 140,90785	60 Nd Neodymium 144.242	61 18 18 22 8 2 Promethium (145)	<sup>2</sup> <sup>18</sup> <sup>23</sup> <sup>23</sup> <sup>23</sup> <sup>23</sup> <sup>23</sup> <sup>23</sup> <sup>23</sup> <sup>23</sup>	63 <b>Eu</b> Europium	64 64 Gadolinium 157.25	<sup>2</sup> <sup>8</sup> <sup>15</sup> <sup>25</sup> <sup>2</sup> <sup>2</sup> <sup>2</sup> <sup>15</sup> <sup>15</sup> <b>Tb</b> <sup>27</sup> <sup>2</sup> <sup>2</sup> <sup>15</sup> <sup>15</sup> <sup>15</sup> <sup>15</sup> <sup>15</sup> <sup>15</sup> <sup>15</sup> <sup>15</sup>	66 28 Dy 152 Dysprosium 162,500	67 28 Ho 29 Holmium 164,93032	68 28 Er 30 Erbium 22	69 28 <b>Tm</b> 35 Thulium 22 168,93421	70 <b>Yb</b> Ytterbium 173.054	71 <sup>2</sup> <b>Lu</b> <sup>32</sup> Lutetium <sup>2</sup> 174,9668	1
				89 Actinium (227)	90 <b>Th</b> 182 182 182 182 182 182 182 182 182 182	91 231.03588	92 U Uranium 238.02891	93 182 192 21 22 22 22 22 22 22 22 22 22 22 22 22	94 <b>Pu</b> Plutonium (244)	95 <b>Am</b> (243)	96 <b>Cm</b> Curium (247)	97 2 <b>Bk</b> 25 <b>Bk</b> 25 Berkelium (247)	98 28 Cf 322 Californium 22 (251)	99 28 18 29 29 29 29 29 29 29 29 29 29 29 29 29	100 28 <b>Fm</b> 32 Fermium 2 (257)	101 18 Md 18 Mendekevium 22 (258)	102 <b>No</b> Nobelium (259)	103 103 Lr 322 Lawrencium 2 (202)	

Elements with similar properties fall in the same vertical columns known as **Groups**. **Periods** are horizontal rows of elements



#### **Periodic Table of Elements**

	1	2 Atomic #	з	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	Hydrogen 1.00754	Name Atomic Mass	С	Solid				Metals			Nonmet							2 <sup>2</sup> He Helium 4.002602	
2	3 <sup>2</sup> Lithium 0.941	4 § Be Beryllium 9.012182	Hg			Alkali me		anthanoid	Transition metals	Poor metals	Other	Noble a:	5 § B Beron 10.811	6 2 Carbon 12.0107	7 8 Nitrogen 14.0007	8 ê Ortygen 15.0004	9	10 8 Ne Neon 20.1797	1 E
з	11 30 Na Sodium 22.98976925	12 Mg Mg Magnesium 24.3050	Rf	f Unknown		imetals		Actinoids	3	las		dases	13 8 Aluminium 20.0616380	14 Si Silicon 25.0855	15 8 P Phosphorus 30.973762	16 3 S Sulfur 32,065	17 27 CI Chiorine 35,453	18 2 Ar Argon 39,945	Sr.R
4	19 K Potassium 29.0982	20 Ottom Ca Calcium 40.078	21 0000 Sc 500000 44.955912	22 Tilanium 47.807	23 Vanadium 50.9415	24 13 Cr 13 51.9901	25 Mn Manganese 54.928045	26 14 Fe 14	27 Cobalt 58.923195	28 19 Ni 19 Nickel 58.0924	29 Cu	30 18 2n 18 2ine 05.28	31 000 000 000 000 000 000 000 000 000 0	32 Ge Gemanium 72.64	33 08 18 18 18 18 18 18 18 18 18 18 18 18 18	34 Se Selenium 78.90	35 187 Br 187 Bromine 79.904	36 Kr Krypton 82.758	23rX
5	37 Rb Rubidium 55.4675	38 50 1000 1000 1000 1000 1000 1000 1000	39 → → → → ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	40 <b>Zr</b> <sup>100</sup> <sup>200</sup> <sup>200</sup> <sup>200</sup>	41 Nb Niobium 52.90635	42 Mo Molybdenum	43 Tc	44 Ruthenium 101.07	45 800 102,00050	46 Pd Palladium	47 Ag Silver 107.8082	48 2000 Cadmium 112.411	49 100 100 100 100 100 100 100 100 100 10	50 50 Sn 10 Tin 118.710	51 300 Sb 100 Antimony 121.760	52 <b>Te</b> 127.60	53 2 ■ 19 Iodine 126.80447	54 100 Xenon 131.293	02Sr.X
6	55 Cs Caesium 132.5054515	56 56 50 50 50 50 50 50 50 50 50 50 50 50 50	57-71	72 1000 Hf 1000 Hafnium 175.49	73 Ta Tantalum 180.54785	74	75 Re Rhenium	76 Os Osmium 100.23	77 ***********************************	78 Pt 105.084	79 Au Gold	80 resources	81 700 100 100 100 100 100 100 100 100 10	82 7000 Pb 1000 Lead 207.2	83 200 Bi 100 Dismuth 205,95040	84 700 Polonium (208.9524)	85 100 100 100 100 100 100 100 100 100 10	86 Rn Radon (222.0176)	102Sr.X
7	87 Fr 32 (222)	Radium (220)	89–103	104 Mar 122 Rf 122 (201)	105 Db Dubnium (202)	106 Sg Seaborgium (200)	107 Bh Bohrium (204)	108 Hassium (277)	109 Mt 3000 (208)	110 DS 10 Damistarillam 17 (271)	1111 Rg Rosentham (272)	112 a Uub a Ununbium 12	113 Uut (284)	114 and a an	115 Uupeyeenkeen (299)	116 Uuh Ununhesium (292)	117 Uus	118 Ununeetium (294)	0102Srx
				F	For elem	ents wit	h no sta	ble isoto	pes, the	mass n	umber o	f the iso	tope with	h the lon	gest hal	f-life is ir	n parenti	neses.	
				Design and Interface Copyright © 1997 Michael Dayah (michael@dayah.com). http://www.ptable.com/															
				57	58 Ce Cerium 140.110	59 Pr Posecotymikam 140.90705	60 Nd Neodymium 144.242	61 Pm Promethium (145)	62 Sm Samarium 150.30	63 100 100 100 100 100 100 100 100 100 10	64 180 Gadolinium 157.25	65 <b>Tb</b> Terbium 150.92535	66 Dy Dysprosium 162.500	67 100 100 100 100 100 100 100 100 100 10	68 1996 Er 1996 Erbium 167.259	69 100 Tm 100.93421	70 <b>Yb</b> Yitterbium 172.054	71 Bu 174,9000	
		com		Actinium	90 <b>Th</b>	91 Pa	92 U 1	93 Np Neptunium	94 Pu Flutonium	95 Am Americium	96 Cm age	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm and	101 Md	102 No Nobelium	103 to and the second s	

### It is divided into four blocks

- s-block –last electron enters s-subshell
- p-block –last electron enters p-subshell
- d-block- last electron enters d-subshell of penultimate shell.
- f-block- last electron enters f-subshell of antipenultimate shell.



C5H11

## 1. The long form of periodic table has periods and ----- groups.

OH

a. 6 and 8

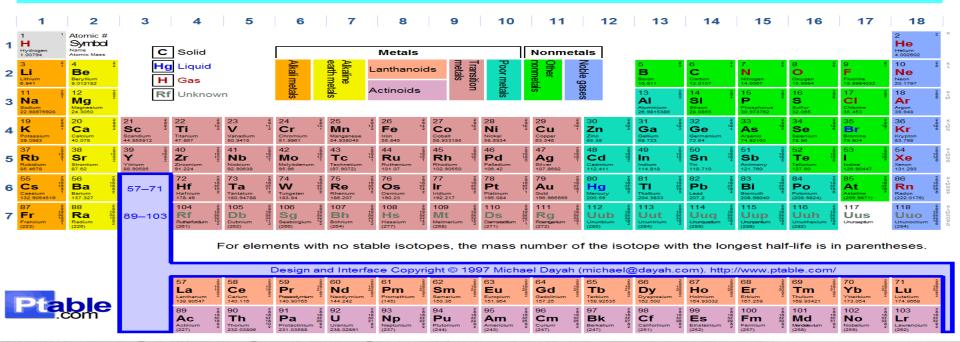
b. 6 and 18

c. 7 and 12

d. 7 and 18



## **Periodic Table of Elements**



**Groups** contain elements with similar properties in vertical columns.

Periods – Principal Quantum number (n) of valence shell.



## The long form of periodic table has 7 periods (horizontal rows) and 18 groups (vertical columns)

C5H11

OH

Ans. d

H<sub>3</sub>C



2. The electronic configuration of an element is 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>4</sup>, identify the correct period, block and group of the given element in the periodic table.
a. 3<sup>rd</sup> period, p – block, 6<sup>th</sup> group

b. 3<sup>rd</sup> period, s – block, 6<sup>th</sup> group

c. 5<sup>th</sup> period, p – block, 12<sup>th</sup> group

d. 3<sup>rd</sup> period, p – block ,16<sup>th</sup> group



# **Period** of the element = Principal Quantum number (n) of valence shell In this it is 3

**Block** of the element = Orbital which receives the last electrons. In this it is p orbital, hence it is in p – block

C5H11





### Group of the element -

- For s-block element No of valence electrons
- For p block element 10 + No. of V electrons For d – block element - No of electrons in
- (n-1) d and ns orbital
- Since this element is in p block,

Group = 10 + 6 = 16

C5H11

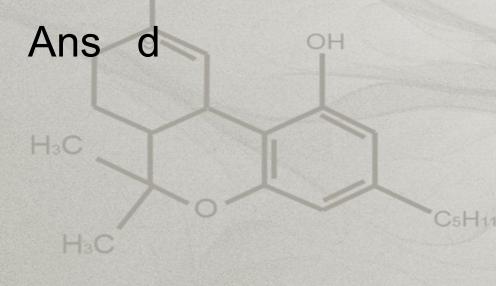
Ans. d. 3<sup>rd</sup> period , p – block ,16<sup>th</sup> group



3. The set of quantum numbers for the last electron in an element are n = 3, l=2, m = +2and s = +1/2. The period, block and group of the element will be; a. 4th period, p-block, 3rd group b. 4<sup>th</sup> period, d – block, 5<sup>th</sup> group H<sub>3</sub>C period , d - block , 5th c. 3<sup>rd</sup> group d. 4<sup>th</sup> period, d – block, 3rd group

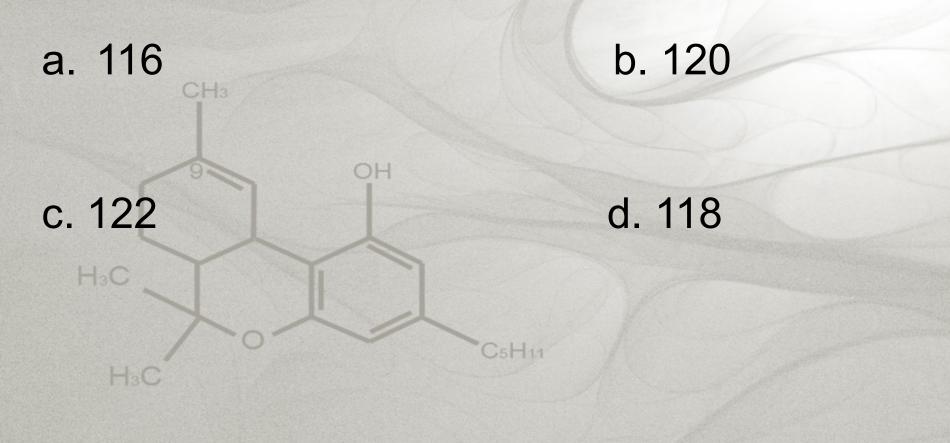


# Since n = 3 and I = 2 and m = + 2outer electronic configuration is $3d^1 4s^2$ i.e 4<sup>th</sup> period , d- block, 3<sup>rd</sup> group.





4. What is the atomic number of the last element in the 7<sup>th</sup> period of the periodic table?





# **Periodic Table of Elements**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
1	1 1 H Hydrogen 1.00794	Atomic # Symbol Name Atomic Mass	С	Solid		[		Metals		][	Nonmetals									
2	3 <sup>2</sup> Li Lithium 6.941	4 22 Be Beryllium 9.012182	Hg H	-		Alkali metals	Alkaline earth metals Alkali metals		i ransition metals ยู	Poor metals	Other nonmetals	Noble ga	5 3 B Boron 10.811	6 <sup>2</sup> C Carbon 12.0107	7 <sup>2</sup> 5 <b>N</b> Nitrogen 14.0087	8 26 O Oxygen 15.9994	9 <sup>2</sup> 7 <b>F</b> Fluorine 18.9984032	10 Neon 20.1797	2 K 8 L	
3	11 28 Na Sodium 22.98976928	12 2 Mg Magnesium 24.3050	Rf	Unknow	/n	<sup>호</sup> 했 Actinoids <sup>⊐</sup> <mark>효</mark>						gases	13 28 3 Aluminium 28.9815386	14 28 Silicon 28.0855	15 <sup>2</sup> <b>P</b> Phosphorus 30.973762	16 <sup>2</sup> S Sulfur 32.085	17 28 CI Chlorine 35.453	18 Ar Argon 39.948	2 K L 8 M	
4	19 28 K 1 Potassium 39.0983	20 28 Ca Calcium 40.078	21 28 Sc 92 Scandium 44.955912	22 28 <b>Ti</b> <sup>10</sup> <sup>2</sup> <sup>10</sup> <sup>2</sup> <sup>2</sup> <sup>10</sup> <sup>2</sup>	23 28 V 11 Vanadium 50.9415	24 28 Cr 13 Chromium 51.9961	25 Mn Manganese 54.938045	<sup>2</sup> / <sub>8</sub> 26 <sup>2</sup> / <sub>8</sub> <sup>13</sup> / <sub>2</sub> <b>Fe</b> <sup>14</sup> / <sub>2</sub> <sup>1ron</sup> <sup>55.845</sup>	27 28 Co Cobalt 58.933195	28 Ni Nickel 58.6934	29 Cu <sup>Copper</sup> 63.546	30 <b>Zn</b> Zinc 65.38	<sup>2</sup> <sup>18</sup> <sup>18</sup> Gallium <sup>69,723</sup>	32 28 <b>Ge</b> 4 Germanium 72.64	33 28 As Arsenic 74.92160	34 28 Se 18 Selenium 78.96	35 28 Br <sup>18</sup> Bromine 79.904	36 Kr <sup>Krypton</sup> 83.798	2 K L M N	
5	37 28 <b>Rb</b> 18 Rubidium 85.4678	38 2 Sr Strontium 87.62	39 <sup>2</sup> <b>Y</b> <sup>18</sup> <sup>18</sup> <sup>9</sup> <sup>9</sup> <sup>2</sup> <sup>2</sup> <sup>18</sup>	40 28 <b>Zr</b> 10 21/224	41 28 <b>Nb</b> 12 Niobium 92.90638	42 28 Mo 13 Molybdenum 95.96	43 <b>TC</b> Technetium (97.9072)	<sup>2</sup> <sup>8</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <b>Ru</b> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup>	45 28 <b>Rh</b> 18 Rhodium 102.90550	46 Pd Palladium 108.42	47 Ag <sup>Silver</sup> 107.8882	48 Cd Cadmium 112.411	<sup>2</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup>	50 28 <b>Sn</b> 18 Tin 118.710	51 28 <b>Sb</b> 18 Antimony 121.780	52 28 <b>Te</b> 127.80	53 28 18 18 18 18 18 18 18 18 18 18 18 18 18	54 Xe <sup>1</sup> <sup>Xenon</sup> 131.293	2 00000	
6	55 28 Cs 18 Caesium 1 132.9054519	56 2 Ba 18 Barium 2 137.327	57–71	72 28 Hf 18 Hafnium 2 178.49	73 28 <b>Ta</b> 322 11 Tantalum 2 180.94788	74 28 W 18 Tungsten 2 183.84	75 <b>Re</b> Rhenium 188.207	<sup>2</sup> <sup>8</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <b>OS</b> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>20</sup> <sup>212</sup> <sup>10</sup> <sup>212</sup> <sup>214</sup> <sup>20</sup> <sup>213</sup> <sup>214</sup> <sup>20</sup>	77 28 <b>Ir</b> 18 18 18 18 18 15 15 192.217	78 Pt 33 Platinum 195.084	79 Au 3 Gold 196.966569	80 <b>Hg</b> Mercury 200.59	$\begin{smallmatrix} & & & & & & \\ & & & & & & \\ & & & & & $	82 28 <b>Pb</b> 322 Lead 4 207.2	83 28 Bi 18 Bismuth 208.98040	84 <b>Po</b> Polonium (208.9824)	85 28 At 18 Astatine 7 (209.9871)	86 <b>Rn</b> <sup>1</sup> Radon (222.0176)	2 8 8 2 8 8 2 8 8 8 2 8 8 8 2 8 8 8 2 8 8 8 2 8	
7	87 2 <b>Fr</b> 32 18 Francium 1 (223)	88 2 <b>Ra</b> 38 <b>Ra</b> 18 18 18 18 18 18 18 18 18 18	89–103	104 28 Rf 18 Rutherfordium 20 (261) 2	105 28 <b>Db</b> 322 Dubnium 11 (262) 2	106 28 Sg 322 Seaborgium 22 (288)	107 Bh Bohrium (284)	<sup>2</sup> <sup>8</sup> <sup>16</sup> <sup>18</sup> <sup>18</sup> <b>Hs</b> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>32</sup> <sup>18</sup> <sup>18</sup> <sup>32</sup> <sup>18</sup> <sup>18</sup> <sup>32</sup> <sup>18</sup> <sup>18</sup> <sup>32</sup> <sup>18</sup> <sup>18</sup> <sup>32</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>32</sup> <sup>12</sup> <sup>12</sup> <sup>12</sup> <sup>12</sup> <sup>12</sup> <sup>12</sup> <sup>12</sup> <sup>1</sup>	109 28 Mt 182 Meitnerium 15 (288) 2	110 <b>Ds</b> Darmstadtium (271)	111 Rg Roentgenium (272)	112 Ununbium (285)	<sup>2</sup> <sup>18</sup> <sup>18</sup> <sup>22</sup> <sup>18</sup> <sup>232</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>18</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>18</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>18</sup> <sup>32</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> <sup>232</sup> 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<sup>235</sup> <sup>235</sup> <sup>235</sup> <sup></sup>	114 28 Uuq 32 Ununquadum 4 (289)	115 Uupentum (288) 28 28 28 28 28 28 28 28 28 28 28 28 28	116 <b>Uuh</b> Ununhexium (292)	117 Uus Uhurseptum	118 Uunoctium 1 (294)	200022200 00022200 00000	

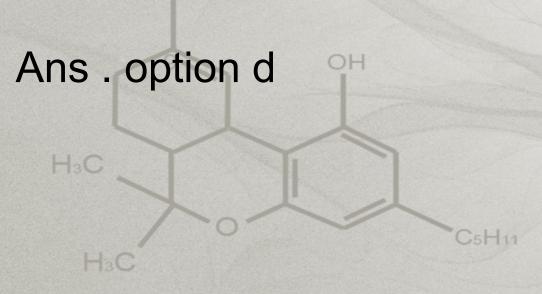
For elements with no stable isotopes, the mass number of the isotope with the longest half-life is in parentheses.



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57 La Lanthanum 138.90547	2 8 18 18 9 2	58 Ce Cerium 140.118	2 8 18 9 2 8	59 28 Pr 28 Praseodymium 140.90765	60 28 Nd 18 Neodymium 144.242	61 28 <b>Pm</b> Promethium (145) 28	62 28 <b>Sm</b> 24 Samarium 150.38	63 Eu Europiur 151.984	18 25 8 Jm 2	64 28 <b>Gd</b> 25 9 Gadolinium 2 157.25	Ter	5 28 <b>18</b> 27 8.92535	66 Dy Dyspr 162.50		67 <b>Ho</b> Holmium 164.93032	2 18 29 8 2	68 Er <sup>1</sup> Erbium 187.259	288082	69 28 <b>Tm</b> 31 Thulium 168.93421	70 <b>Yb</b> Ytterbium 173.054	2	71 2 Lu 32 Lutetium 2 174.9668
89 Actinium (227)	2 18 18 18 18 9 2	90 <b>Th</b> Thorium 232.03806	18 32 18	91 28 Pa 20 Protactinium 231.03588	92 28 U 18 Uranium 9 238.02891	93 <sup>2</sup> <b>Np</b> <sup>18</sup> Neptunium <sup>9</sup> (237) <sup>2</sup>	94 28 Pu 18 Plutonium 22 (244)	95 <b>Am</b> Americiu (243)	18 32 25 ium 2	96 28 Cm 322 Curium 9 (247) 2		3 <b>k</b> 18 322 17 18 18 27 18	98 Cf Califor (251)	2 18 32 28 rnium 2	99 Es Einsteinium (252)	2 18 32 29 8 2	100 <b>Fm</b> <sup>1</sup> Fermium (257)	2882082	101 28 Md 18 Mendelevium 2 (258)	102 <b>No</b> Nobelium (259)	18 32 32 8 2	103 28 Lr 322 Lawrencium 9 (262)



In the long form of periodic table  $7^{\text{th}}$  period is the last period , This period can take max. 32 elements. The last element will be in p – block with atomic no.118.



CH3



H<sub>3</sub>C

CHEMISTRY

C5H11

# 5. Which of the following is not a periodic property ?

OH

# a. Mass number

b. Electron affinity

c. Ionisation energy

d. Electronegativity



Ionisation energy, electronegativity and electron affinity are the properties that depends on the arrangement of electrons in an atom. ( i.e electronic configuration). Hence they show periodicity.

Mass number is the sum of no. of protons and neutrons present in the nucleus of an atom. It is not a periodic property.

C5H11

Ans. Option a.



If the energies of the orbital increase with the increase in "n" values ,[violating (n+l) rule] then name the block to which the element potassium (Z= 19) belongs;

C5H11

OH

a.s - block

H<sub>3</sub>C

b. p - block

c.d-block

d. f-block



If the energy of orbitals increase with the increase in " n" values, then the electronic configuration of the element potassium (Z=19) becomes  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^1$ 

C5H11

OH

Ans. c ; d-block



# 7. Which one of the following is not a property of an isolated atom?

C5H11

OH

a. Atomic radius

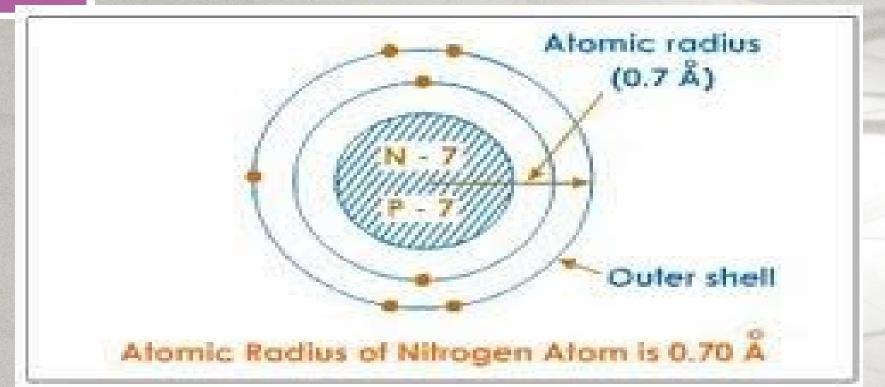
b. Electron affinity

c. Ionisation energy

H<sub>3</sub>C

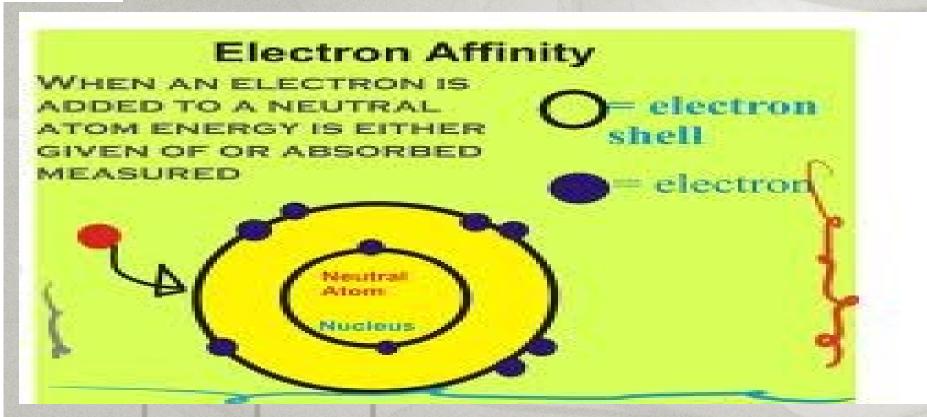
d. Electronegativity



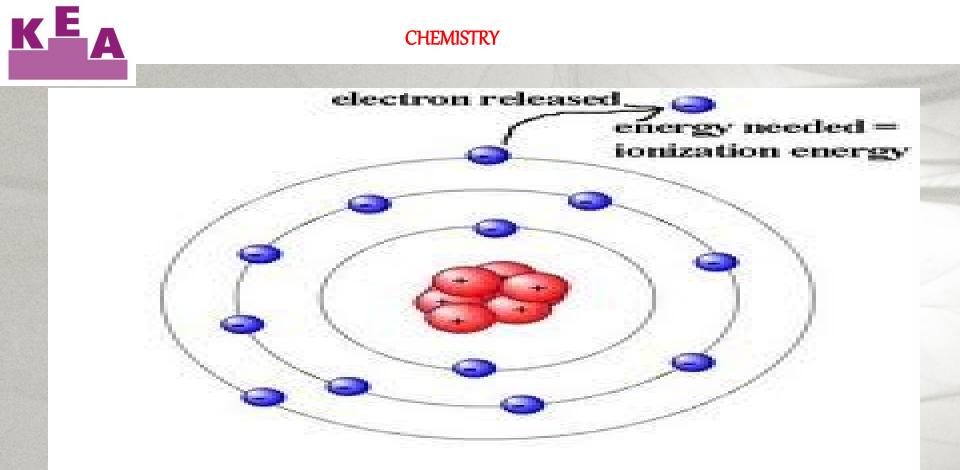


Atomic radius is the distance from the centre of the nucleus of an atom to the outermost shell electrons.



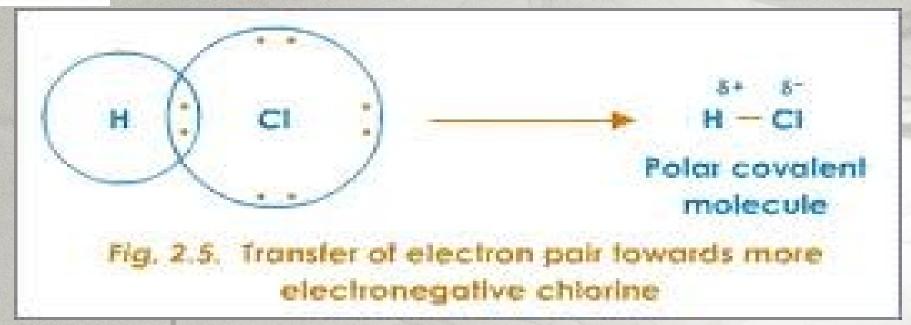


**Electron affinity** is the energy released when an electron is added to an isolated neutral gaseous atom .



**Ionization energy** is the energy required to remove the most losely bound electron from a gaseous isolated neutral atom.





**Electronegativity** is the capacity to attract the shared electron pair towards itself in a covalent bond molecule. It is the property of an **atom in a molecule**.

C5H11

Ans. option d



8. The correct sequence of atomic radii is

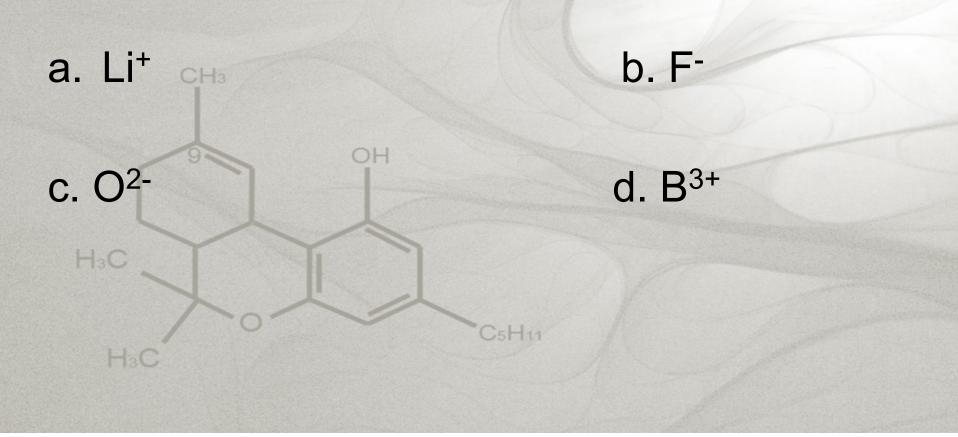
a. AI > Si > Na > Mgb. Si > Al > Mg > Na c. Si > Al > Na > Mg H<sub>3</sub>C d. Na > Mg > Al > Si HaC

**CHEMISTRY** 1 18 He 17 16  $\mathbf{2}$ 13 1415 Li Be B Ne 0 **PNI**  $\odot$ Na Mg Si AL 53 CI Ar K Ca Ge As Se Ga Br Kr Rb Sr Sn Sb Te In Xe Cs Ba B  $\bigcirc$ B 1310 0 1-66 SI (P) s Ma: A.F ALC: N Mg

All these elements are in the same period i.e. 3<sup>rd</sup> period . Atomic radii decreases on moving across a period. Ans . Option d Na > Mg > Al > Si



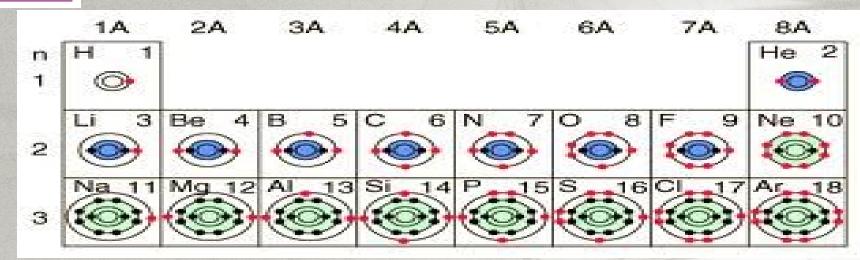
# 9. Which of the following ions has the highest value of ionic radius?





CH3

CHEMISTRY



These are ions of elements belong to 2<sup>nd</sup> period. The atomic radius decrease from left to right (Li, B,O,F) in the period.

Anions are bigger than the curresponding atoms.



## Li<sup>+</sup> and B<sup>3+</sup> are cations have small radius.

F<sup>-</sup> and O<sup>2-</sup> are anions.

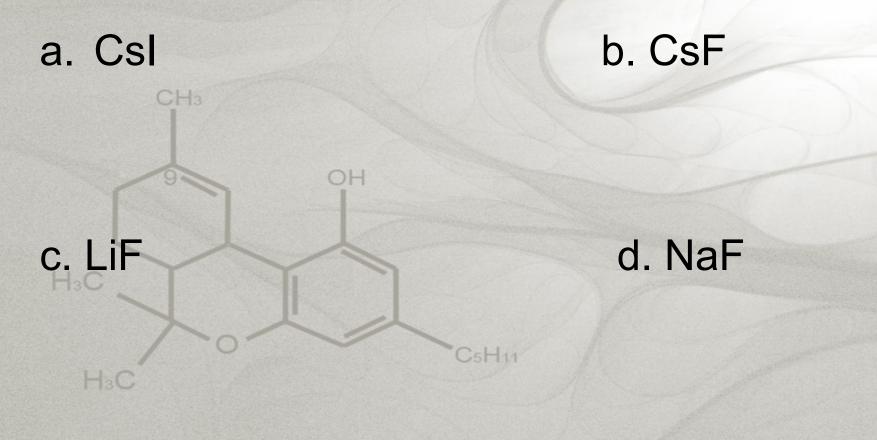
Among these two anions, the one which carry more negative charge is bigger, hence O<sup>2-</sup> has the highest value of ionic radius.

Ans. Option c

H<sub>3</sub>C

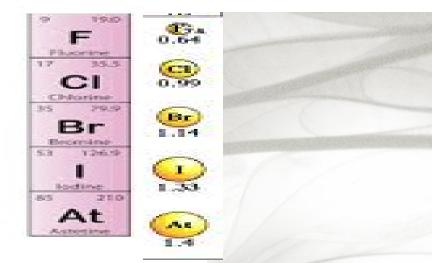


# 10. Which one of the following has highest cation to anion size ratio?





Lii Na Na K K Rb CS Er

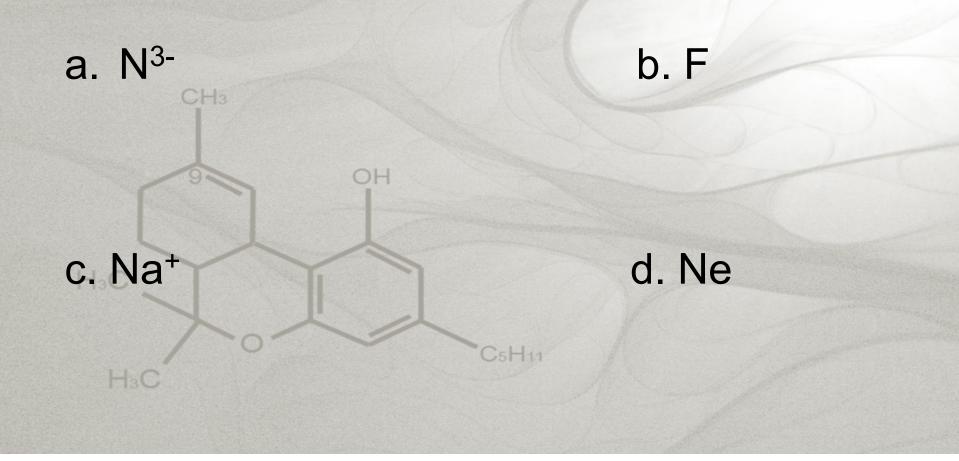


# Alkali metals Halogens Among alkali metal cations $(Li^+, Na^+, Cs^+)$ Cs<sup>+</sup> has biggest size and among halogens (F<sup>-</sup>, I<sup>-</sup>) F<sup>-</sup> has smallest size.

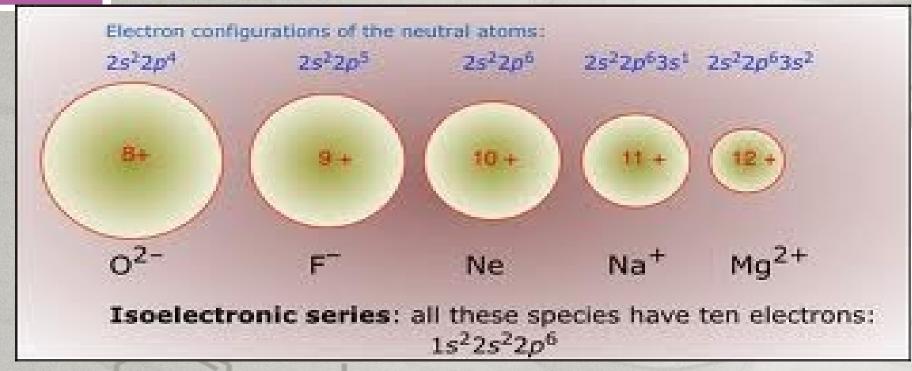
Therefore CsF has highest Cs<sup>+</sup> / F<sup>-</sup> ratio. Ans. Option b



## 11. The anion O<sup>-1</sup> is isoelectronic with







Species which have same number of electrons are known as isoelectronic species. Here Na<sup>+</sup>, N<sup>3-</sup> and Ne have 10 electrons.



## Oxygen gaining 1 electron become(O<sup>-1</sup>) ion . $O + e \longrightarrow O^{-1}$ $224 \qquad 225$

# It has only 9 electrons. Hence it is in isoelectronic with fluorine

C5H11

Ans. Option b.

H<sub>3</sub>C



# 12.Which one of the following element has highest ionization energy ?

a. [Ne] 3s<sup>2</sup> 3p<sup>1</sup> b. [Ne] 3s<sup>2</sup> 3p<sup>3</sup>

C5H11

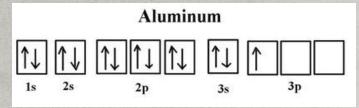
OH

c. [Ne] 3s<sup>2</sup> 3p<sup>2</sup>

d. [Ar] 3d<sup>10</sup>4s<sup>2</sup> 4p<sup>2</sup>

H<sub>3</sub>C







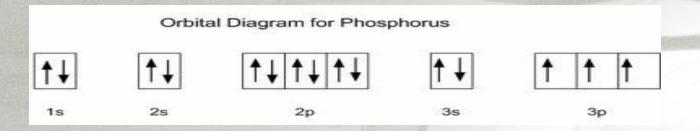
- AI –13:[ Ne]  $3s^2 3p^1$  Si 14: [Ne]  $3s^2 3p^2$
- Ge 32: [Ar] 3d<sup>10</sup>4s<sup>2</sup> 4p<sup>2</sup>

In all these 3 elements valence shell orbital is incompletely filled - Relatively lower IE

C5H11



## P – 15 : [Ne] 3s<sup>2</sup> 3p<sup>3</sup>



If the valence shell orbital of an atom is half filled or completely filled which is more stable, it has higher IE.

C5H11

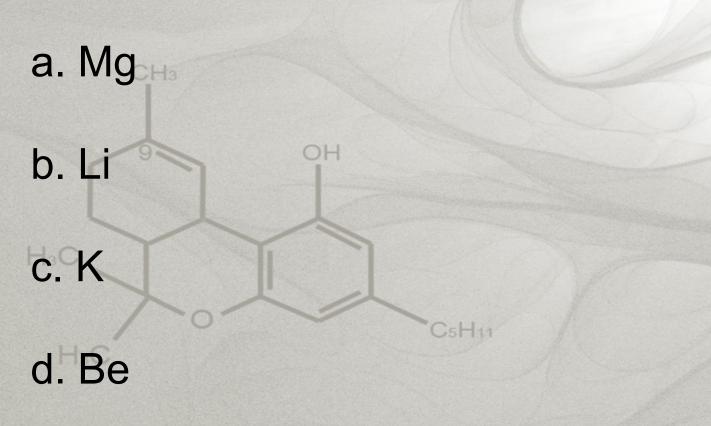
Ans. option b

HC

H<sub>3</sub>C



# 13.Which of the following element will have the lowest first ionization energy?







Li & K belong to 1<sup>st</sup> group have lowest I E. Be & Mg belong to 2<sup>nd</sup> group higher I.E Since I.E decrease from top to bottom in a group. Potassium has lowest first I.E

C5H11

Ans. Option c



- 14. Which statement about bond polarity is true? a.Oxygen is less electronegative than nitrogen. b.Atom become more electronegative as move to the right across a period in a periodic table.
- c. Atom become more electronegative as move down a group .
  d. Chlorine is more electronegative than flourine.



1

l i 1.0

Na

0.9 к

0.8

Rb 0.8

Cs 0.7

Group Grou

### CHEMISTRY

		12	4 .1				18 Group 8A	
2 Froup		13 Group	14 Group	15 Group	16 Group	17 Group		
2A		3A	4A	5A	6A	7A		
Be 1.5		B 2.0	C 2.5	N 3.0	0 3.5	F 4.0		
Mg 1.2		AI 1.5	Si 1.8	P 2.1	S 2.5	CI 3.0		
Ca 1.0		Ga 1.6	Ge 1.8	As 2.0	Se 2.4	Br 2.8		
Sr 1.0		In 1.7	Sn 1.8	Sb 1.9	Te 2.1	І 2.5		
Ва 0.9		TI 1.8	Pb 1.9	Bi 1.9	Po 2.0	At 2.1		
CI	polority io		otoin	ad	fr	<b>~ ~</b>		

Bond polarity is optained Trom Electronegativity, - It indicates the attraction of an atom for shared electrons. It increases as move to right across a period. Oxygen is more electronegative than nitrogen.

KEA
-----

1 Group 1A	2 Group 2A	13 Group 3A	14	15 Group 5A	16 Group 6A	17 Group 7A	18 Group 8A
Li 1.0	Be 1.5	B 2.0	C 2.5	N 3.0	0 3.5	F 4.0	
Na 0.9	Mg 1.2	AI 1.5	Si 1.8	P 2.1	S 2.5	CI 3.0	
К 0.8	Ca 1.0	Ga 1.6	Ge 1.8	As 2.0	Se 2.4	Br 2.8	
Rb 0.8	Sr 1.0	In 1.7	Sn 1.8	Sb 1.9	Te 2.1	1 2.5	
Cs 0.7	Ва 0.9	TI 1.8	Pb 1.9	Bi 1.9	Po 2.0	At 2.1	

Electronegativity decrease down the group Hence Chlorine is less electronegative than flourine.

C5H11

F is most electronegative element.

Ans. Option b



15. The electronic configuration of some elements are given below. Out of these which one has lowest chemical reactivity?

# a.1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>1</sup>

## b. 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>3</sup>

c. 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>5</sup> d. 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup>





Na: 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>1</sup>

CH3



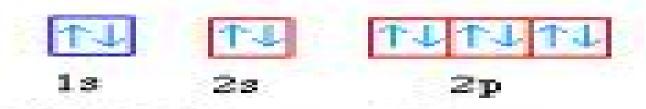
```
N: 1s^2 2s^2 2p^3
```

## $CI: 1s^2 2s^2 2p^6 3s^2 3p^5$

Chemical reactivity depends on the number of valency electrons. All these elements are more reactive.



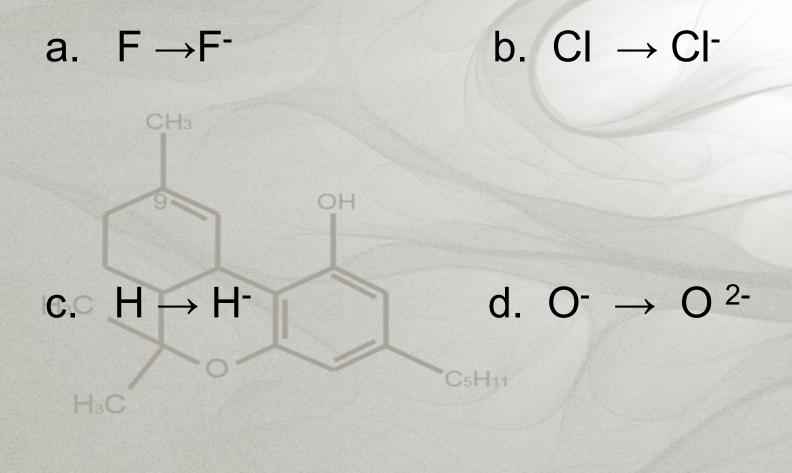
Noble gas	Symbol	Atomic number	Electronic configuration K L M N O P	Valence electrons
Helium	He	2	2	2
Neon	Ne	10	2 8	8
Argon	Ar	18	2 8 18	8
Krypton	Kr	36	2 8 18 8	8
Xenon	Xe	54	2 8 18 18 8	8
Radon	Rn	86	2 8 18 32 18 8	8



Electronic configuration of Ne (Noble gas) in which both s and p orbitals are completely filled , hence it has lowest reactivity. Ans. Option d



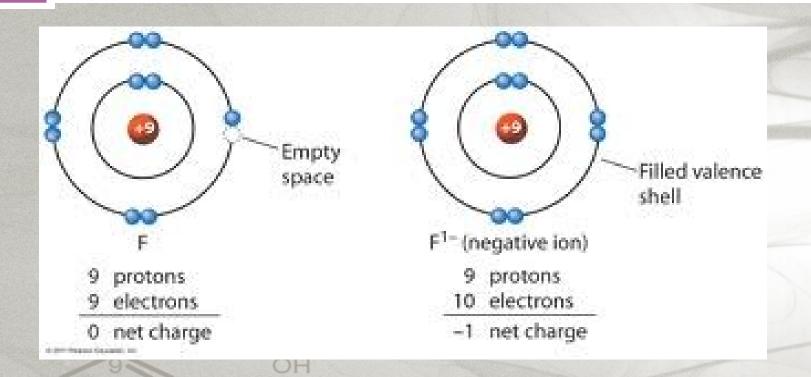
### 16. The process which is endothermic :





H<sub>3</sub>C

### CHEMISTRY



Addition of electron to a neutral atom is exothermic.

C5H11



# Addition of $2^{nd}$ electron to an anion is endothermic. $O^- \rightarrow O^{2-}$



Energy is needed to overcome the repulsion between the electrons already present in the anion and the electron being added . Ans. Option d



# 17. Which element has maximum electron affinity?

a. [Ne] 3s<sup>2</sup> 3p<sup>3</sup> b. [Ne] 3s<sup>2</sup> 3p<sup>4</sup>

OH

c. [Ne] 3s<sup>2</sup> 3p<sup>5</sup>

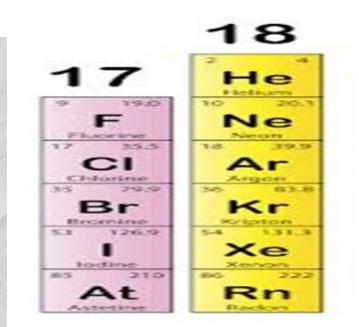
CH<sub>3</sub>

d. [Ar] 4s<sup>1</sup> 3d<sup>5</sup>

C5H11



- P 15 : [Ne]  $3s^2 3p^3$
- S 16 : [Ne] 3s<sup>2</sup> 3p<sup>4</sup>
- CI 17 : [Ne] 3s<sup>2</sup> 3p<sup>5</sup>
- Cr 24 : [Ar] 4s<sup>1</sup> 3d<sup>5</sup>



An element which has very strong tendency to accept an electron, to aquire noble gas configuration has maximum electron affinity.

C5H11

Halogens have highest E.A



## CI + e $----- \rightarrow CI^{-}$ [Ne] $3s^2 3p^5$ [Ne] $3s^2 3p^6$

# Only one electron gaining is sufficient to aquire noble gas configuration of Ar

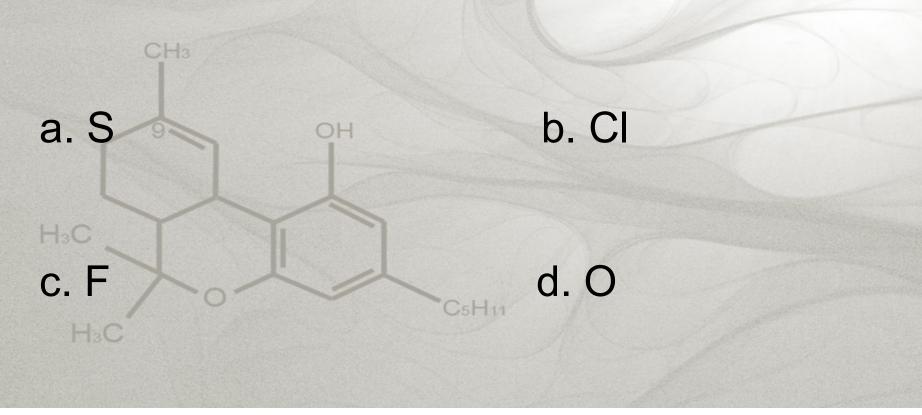
C5H14

Ans. Option c

H<sub>3</sub>C



## 18. Which one of the following element has highest electron affinity (with negative sign) ?





and the second se	100	and the second second	and the second se
Tab	ALC: NOTE: N		- 10 C
		10 C 10 C	
			10 March 10

H 72.8							He (-21.3)
LI	Be	B	C	NO	0	F	Ne
59.8	(-241)	23.2	123		141	322	(-28.9)
Na	Mg	AI	SI	P	8	CI	Ar
52.9	(-232)	44.4	120	74.3	200	349	(- 34.7)
K 49.0							

Electron affinity (with negative sign) increase along a period and decrease down the group.

Exception, electron affinity of O < S and F < CI, due to interelectronic repulsion in the compact 2p - orbital of O and F Ans . option b.



H<sub>3</sub>C

CHEMISTRY

Arrange the following elements in the increasing order of metallic character:
 B, K, Mg, Al.

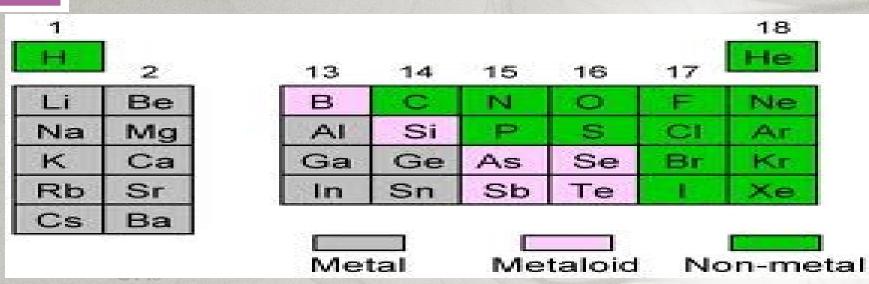
a. AI < B < Mg < K b. B < Mg < AI < K.

c. K < Mg < AI < B d. B < AI < Mg < K

C5H11

KEA

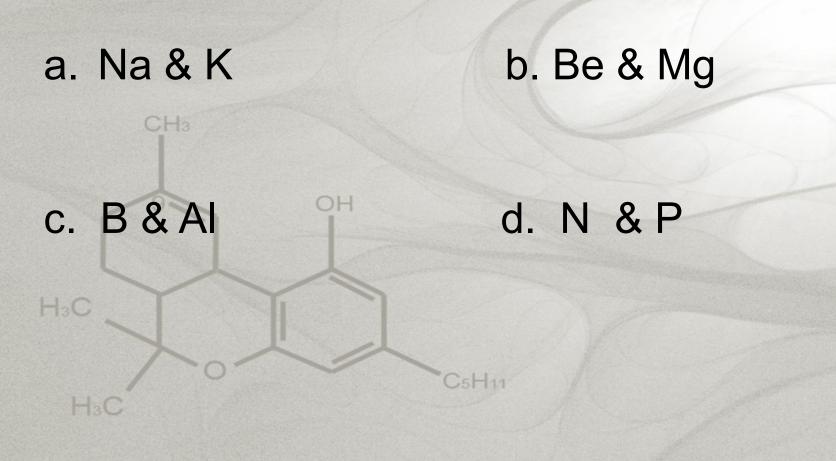
### CHEMISTRY



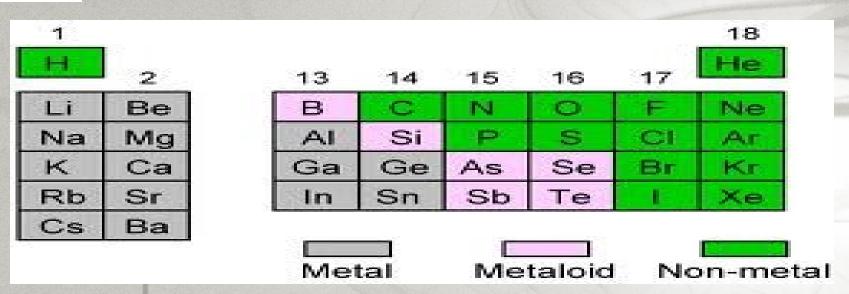
Metallic character increases on moving down the group and decreases on moving across a period from left to right. Ans. Option d. B < Al < Mg < K



## 20. Which elements are non metals?







Metallic character decreases from left to right in the periodic table. Metals on the left of periodic table. Non metals appear to the right of the periodic table. Ans. Option d , N & P



# 21. Group I elements do not occur free (native state) in the nature because.

### a. They are unstable

CH3

## b.Their compounds with other elements are highly stable

c. Their chemical reactivity is very high

## d. None of these



# I group elements (alkali metals) are highly reactive, hence they do not occur in free state.

C5H11

OH

Ans. Option c

H<sub>3</sub>C



OH

### 22. ----- is a radioactive alkaline earth metal

C5H11

## a. Francium

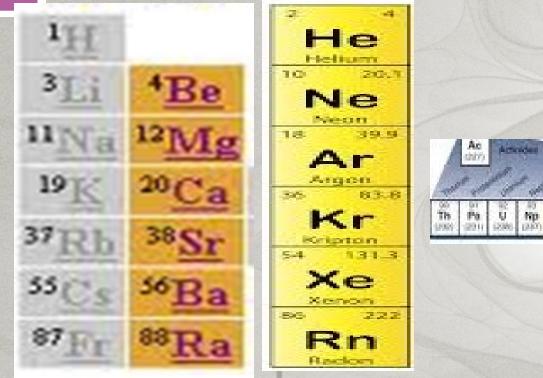
### b. Radium

## c. Radon

H<sub>3</sub>C

d. Uranium





Francium (Fr) is a radioactive alkali metal. Radon (Rn) is a radioactive rare gas. Uranium is a radioactive inner transition element. Ans. Option b i.e. Radium

Cm Cath

Am.

CI.

88

Fm.

Ъ£.

29



# 23.Which statement is characteristic of metals?

- A: They are shining
- B: They are poor conductor of electricity

C5H11

C: They melt at high temperature

a.Statement A only

- b. Statement A & B only
- c. Statement A & C

d. Statement A,B,C





C5H11

Metals are shining – metallic lustre





H<sub>3</sub>C

### CHEMISTRY



C5H11

## Metals melt at high temperature



MiniScience.com

### They are good conductor of electricity

OH

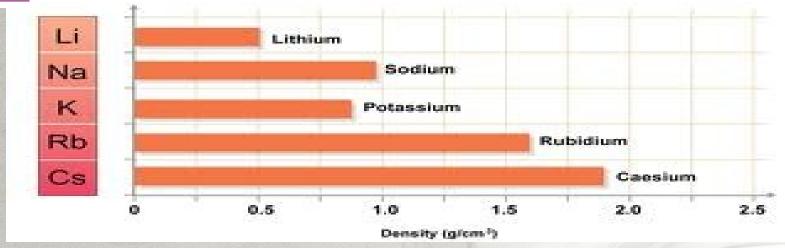
## Ans.Optionc. Statement A & C are correct



# 24.The correct order of density of the following metals is

a. Li < Na > KCH<sub>3</sub> b. Li > Na > K OH c.Li < Na < Kd. Li > Na < K C5H11





Density of alkali metals increases down the group. Lithium is the lightest metal.

Exception, density of potassium is less than that of sodium.

H<sub>3</sub>C



Density of Li – 0.534 g /cm Na - 0.972 g /cm<sup>3</sup> (At. radius – 186 pm) K - 0.869 g / cm<sup>3</sup> (At. radius - 227 pm)

This is due to abnormal increase in atomic size of potassium

C5H11

OH

Ans .Option a

Li < Na > K



H<sub>3</sub>C



# 25.Compared to alkali metals, alkalline earth metals

- a. are more metallic
- b. have lower m.p.

CH3

- c. have larger atomic radii
- d. have higher densities



# Alkaline earth metals are less metallic, due low electropositivity.

# Alkaline earth metals have higher m.p , due to strong metallic bond

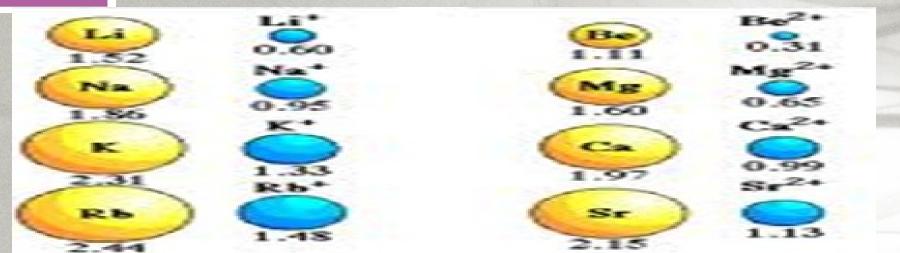
C5H11



H<sub>3</sub>C

CH<sub>3</sub>





Alkalline earth metals have higher densities due to smaller atomic size (d = m/v) and stronger metallic bond than alkali metals.

C5H11

Ans. Option d



# 26. Sodium reacts with water more vigorously than lithium because

- a. It has higher atomic weight
- b. It is more electronegative

CH3

- c. It is more electropositive
- d. It has higher ionization energy



## In alkali metals are highly electropositive due to low ionisation energy .

Electropositive nature increases from Li to Cs.

Hence reactivity with water also increases.

C5H11

Ans. Option c

H<sub>3</sub>C



27. Which one is true for a salt Na<sub>2</sub>Co<sub>3</sub>?
a. It gives voilet colour to bunsen flame & its aqueous solution turns red litmus blue

b. It gives voilet colour to bunsen flame its aqueous solution turns blue litmus red

c. It gives golden yellow colour to bunsen flame
 & its aqueous solution turns red litmus blue

d. It gives golden yellow colour to bunsen flame
 & its aqueous solution turns blue litmus red

KEA







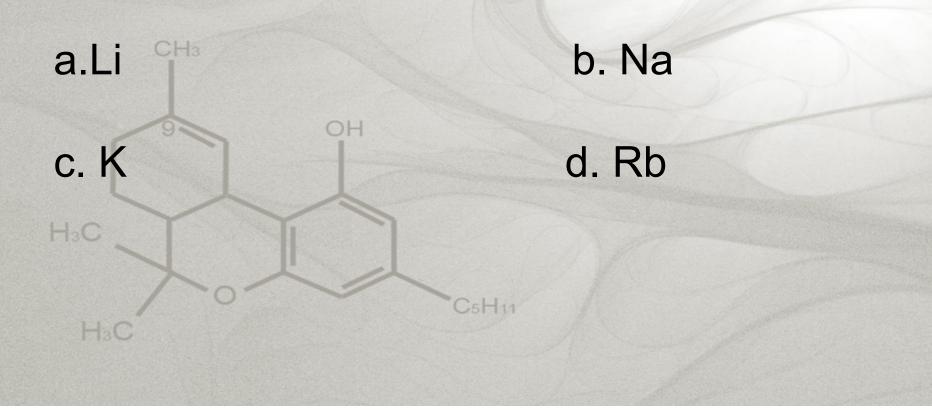
Sodium flame

Potasium flame

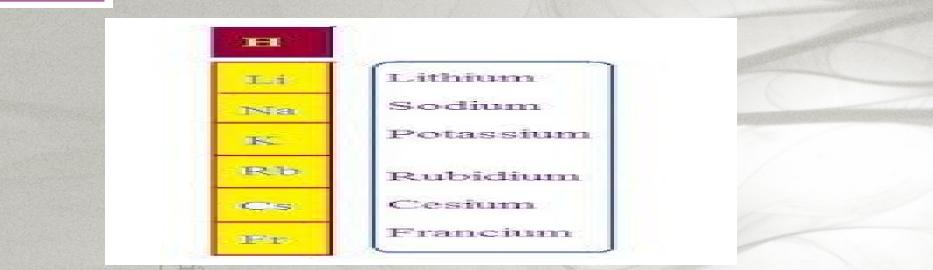
Sodium salts gives golden yellow color flame. Potassium salts gives violet color flame Sodium carbonate aqueous solution is alkaline due hydrolysis , hence it turns red litmus paper turns blue. Ans. Option c



## 28. Which one of the alkali metal forms only normal oxide $M_2O$ ?





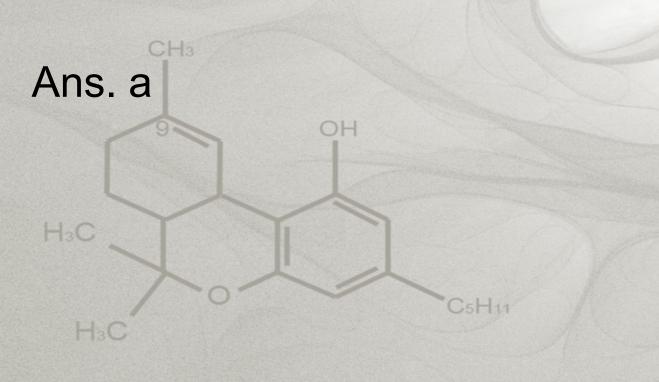


## Sodium forms peroxide $(Na_2O_2)$ ,

whereas potassium , rhubidium and caesium forms superoxides ( $KO_2$ ,  $RbO_2$  and  $CsO_2$ ) when these metals are burnt in air.

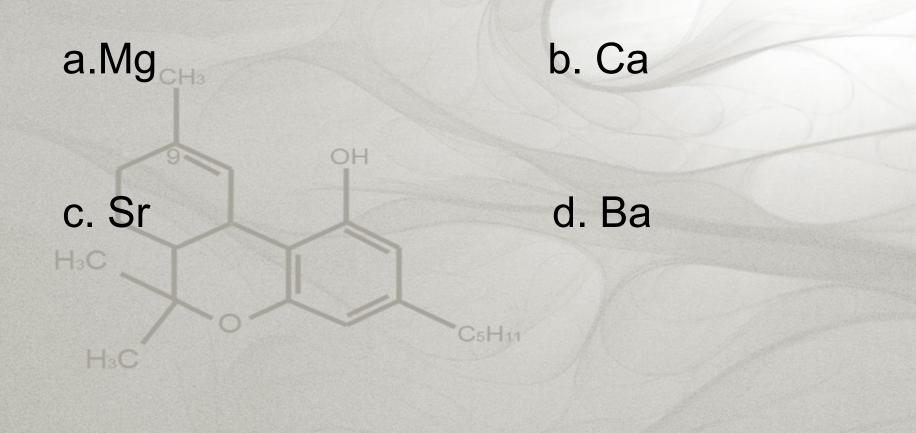


## Only lithium form normal oxide $(Li_2O)$ when this metal is burnt in air.

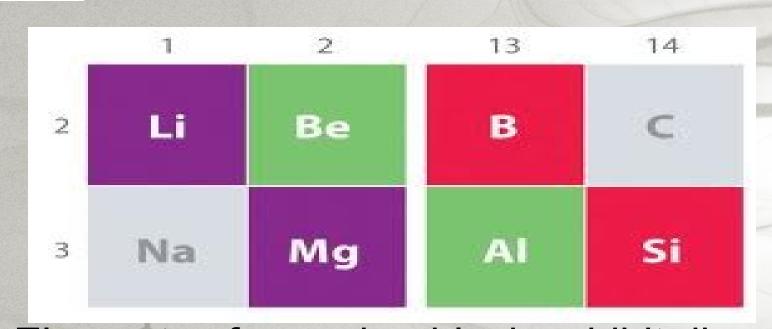




## 29. Lithium resembles ----- of group 2 in its properties.







Elements of s- and p- block exhibit diagonal relationship . i.e. Similarities in properties with 2<sup>nd</sup> element of next group. E.g Li - Mg , Be – Al and B – Si show diagonal relationship Ans. a



30. Which among the following element has the higher value of second ionisation energy?

C5H11

OH

a. Magnesium

## b. Calcium

c. Sodium

H<sub>3</sub>C

d. Stroncium



## Na<sup>+</sup> has stable noble gas configuration Na -----→ Na<sup>+</sup> 2 8 1 2 8

## 1<sup>st</sup> IE of Na- 495.8kJ 1<sup>st</sup> IE of Mg - 737.7kJ

2<sup>nd</sup> IE of Na - 4562kJ 2<sup>nd</sup> IE of Mg -1450.6 kJ

C5H11

Ans. Option c

H<sub>3</sub>C



## 31. Which of the following metal is most commonly used in photochemical cells?

C5H11

OH

### a. Lithium

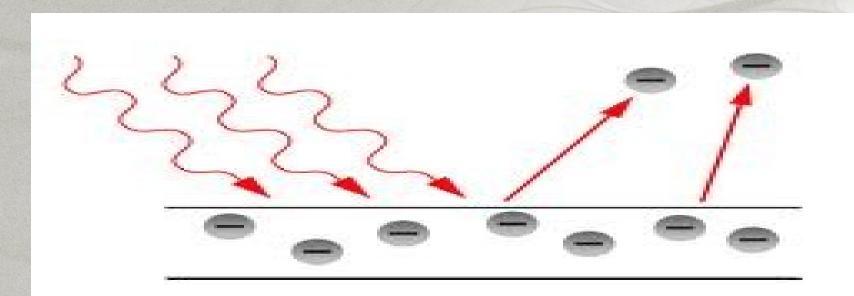
## c. Caesium

H<sub>3</sub>C

## b. Calcium

### d. Francium





Phenomenon of emission of electrons when metal surface is exposed to light is known as photoelectric effect



Alkali metals have low I.E. Hence they emit electrons even when exposed to light.

I.E in alkali metals decreases down the group,

Cs has lowest I.E. It shows maximum photo electric effect , hence used in photochemical cells.

C5H11

Ans. Option c

HaC



## 32. The fourth period of the p – block element contains

OH

a. 8 elements.

### b. 6 elements.

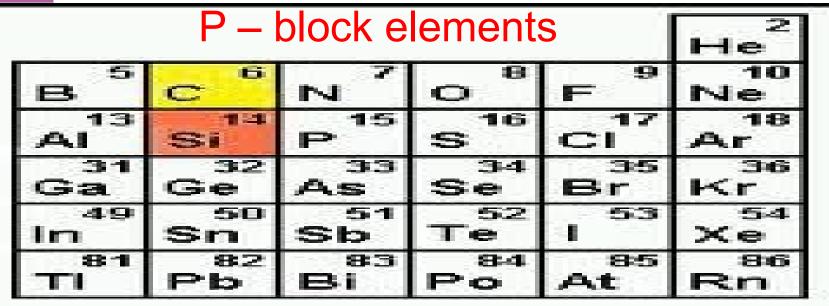
c.10 elements.

H<sub>3</sub>C

d.18 elements.

C5H11

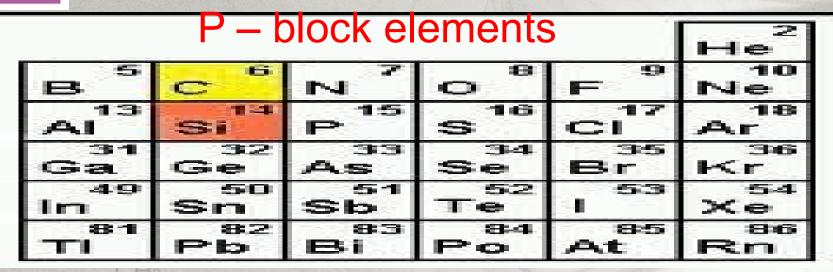




The elements from group 13 to group 18 are known as p – block elements.

C5H11





Each period in p – block elements contains only 6 elements

C5H11

p – orbital can take max. 6 electrons.

Ans. b.



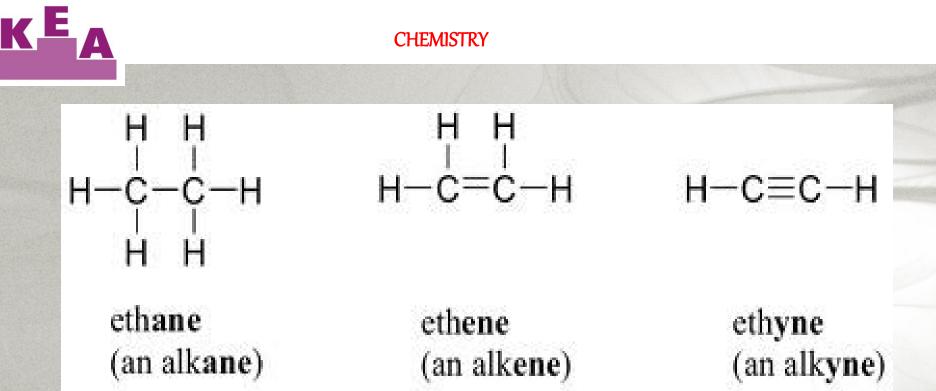
HaC

- 33. Which of the following statement is not true about carbon ?a. It is the main constituent of inorganic matter.
- b. It has ability to form multiple bond

c. Its tendency to form long chain

OH

d. It has limited covalence of four

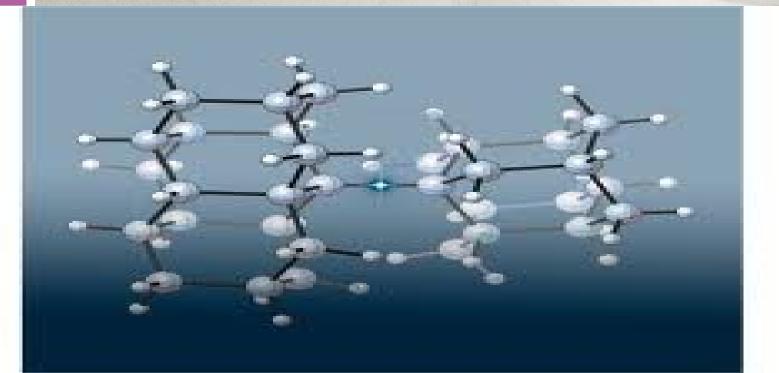


Carbon forms double bond, triple bond with carbon and other elements

C5H11

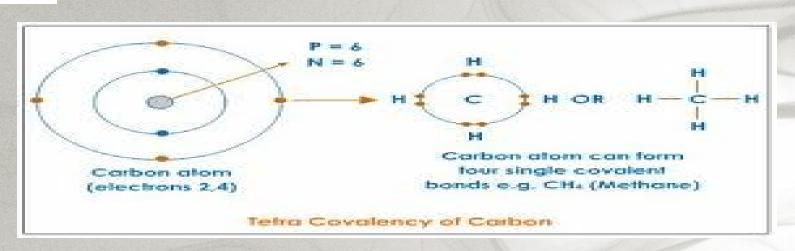






Its tendency of forming long chain is a catenation property. (self linking property)





Carbon has limited covalence of four because of non availability of d- orbital electrons It is the main constituent of organic Matter

Ans. Option a



H<sub>3</sub>C

CHEMISTRY

## 34. Carbon atom in diamond are arranged in

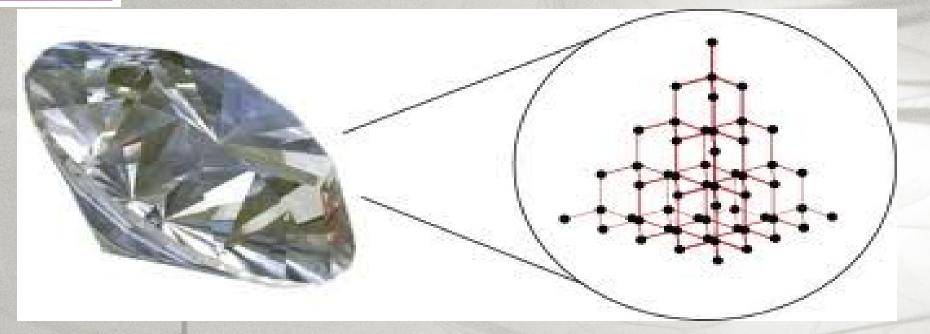
## a.Planar configuration

## **b.**Tetrahedral configuration

c. Linear configuration

d. Octahedral configuration





Carbon atoms in diamond are in a state of sp<sup>3</sup> hybridization and are arranged in tetrahedral configuration.

C5H11

Ans. Option b



## 35. Except ------ all the 14<sup>th</sup> group elements exhibit allotropy

C5H11

OH

a. C

- b. Si CHS
- c. Pb
- d. Sn



Carbon has number of allotropes i.e. diamond, graphite, coal, wood charcoal, lamp black, fullerene, coke

Si, Ge and Sn also show allotropy.

Whereas Pb exists only in metallic form. Ans. Option c

C5H11









## Graphite

### Diamond

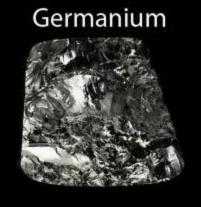


Etacude.com

### **Crystalline Silicon**

### **Amorphous Silicon**





C5H11





## Grey tin



## White tin



H<sub>3</sub>C

CHEMISTRY

36. Which of the following pair has similar crystal structure ?a. Graphite & diamond

b. Graphite & crystalline silicon

c. Diamond & crystalline silicon

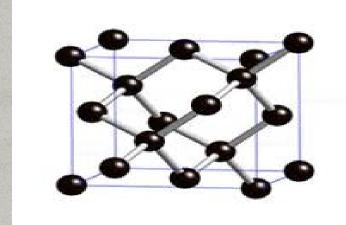
OH

d. Diamond & amorphous silicon



## Graphite has layered structure and diamond has 3 dimensional structure





### **Diamond Structure**

## Silicon Structure

Crystalline silicon and diamond have similar crystal structure. Ans. Option c



H<sub>3</sub>C

CHEMISTRY

37. p – type semiconductor is obtained when silicon is mixed (doped) with
a. Trivalent impurities

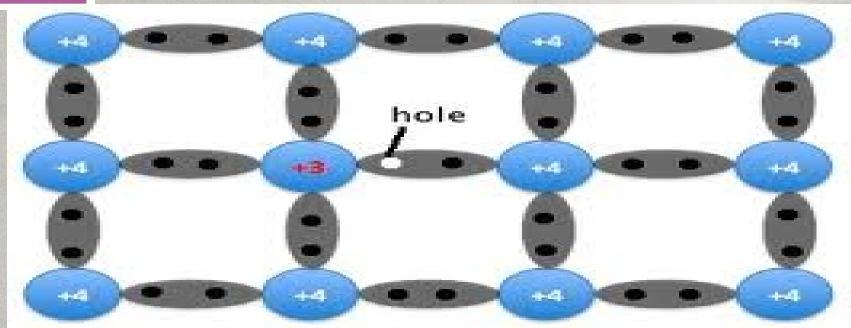
b. Tetravalent impurities

c. Pentavalent impurities

d. Divalent impurities







Trivalent impurities like boron leaves a positive hole , the electrons move to fill these holes, hence conduct electricity. Ans. Option a



C5H11

## 38. In n – type semiconductors there is

OH

### a. A cation

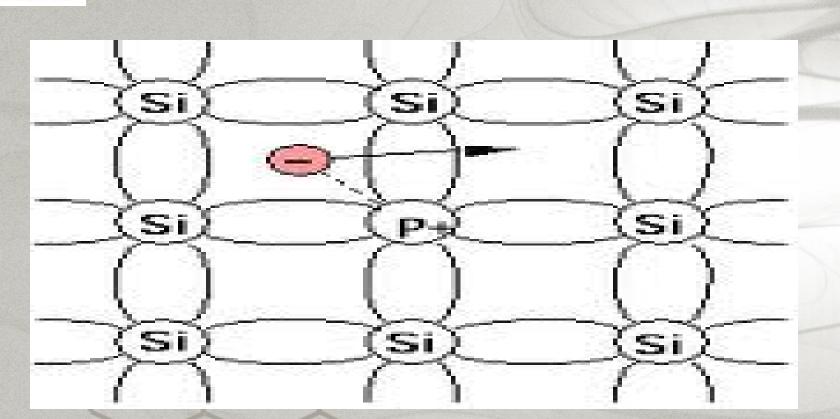
## b. A Positive hole

c. An Electron

d. An Anion

H<sub>3</sub>C





In n – type semiconductors pentavalent impurities give extra electron. Ans. c An electron



39. The shapes of Fullerene ( $C_{60}$ ) resembles that of soccer ball with a. Six member carbon rings

b.Five member carbon rings

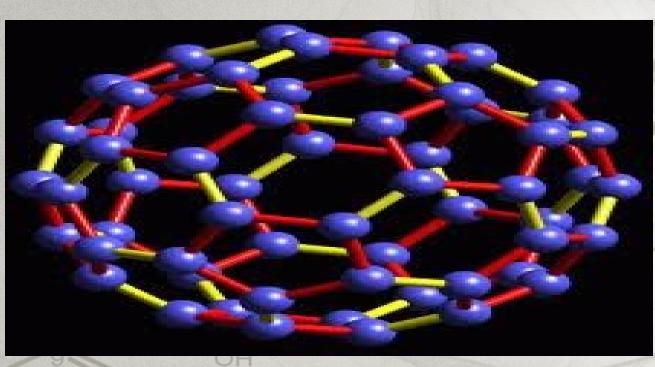
c. Five and six member carbon rings

OH

d. Seven member carbon rings

H<sub>3</sub>C





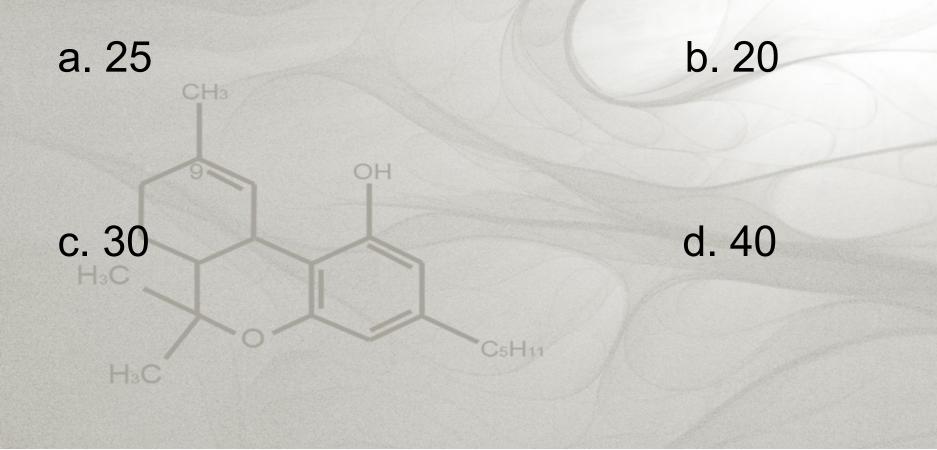
## $C_{60}$ contains 12 five membered rings and 20 six membered rings.

Ans. Option c

C5H11



## 40. No. Of hexagonal rings in C<sub>70</sub> type of fullerene is





## No. Of hexagonal rings = $\underline{n-20} = \underline{70-20}$ 2 2 = 25

## Ans. option a There are 25 hexagonal rings and 12 pentagonal rings in C<sub>70</sub> type of fullerene



OH

## 41. Which of the following oxidation states are the most characteristic for lead and tin respectively?

C5H11

a. +2, +2
b. +4, +2
c. +2, +4
d. +4, +4

H<sub>3</sub>C



H<sub>3</sub>C

CHEMISTRY

## Due to inert pair effect + 2 oxidation state of lead is more stable, while + 4 state of tin is more stable.

C5H11

### Ans. option c : +2, +4

CH<sub>3</sub>



42. An element belong to 3<sup>rd</sup> period and 13<sup>th</sup> group of the periodic table . Which of the following properties will be shown by the element.

C5H11

a.Liquid non metallic

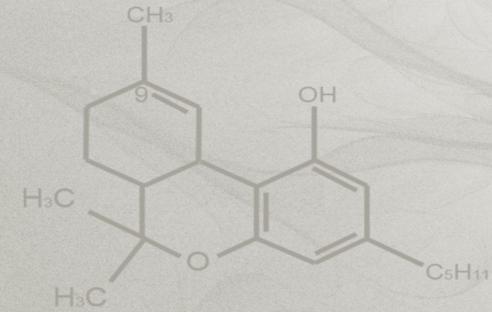
b.Liquid metallic

c.Solid metallic

d.Solid non metallic

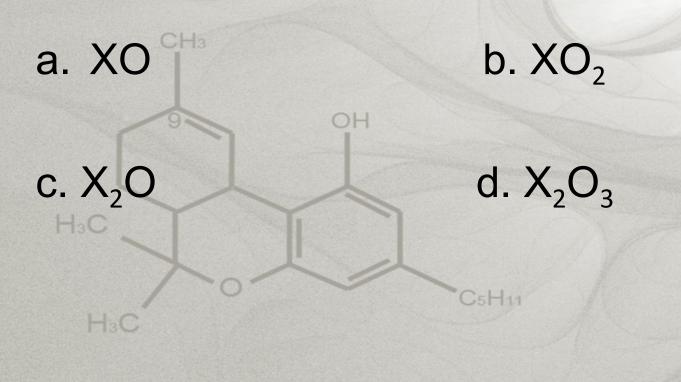


## Ans. Option c





# 43. The formula of a stable binary compound formed from 14<sup>th</sup> group element (X) with oxygen is





The common valency of 14<sup>th</sup> group elements is + 4. Hence formula of stable compound of this group is XO<sub>2</sub>

C5H11

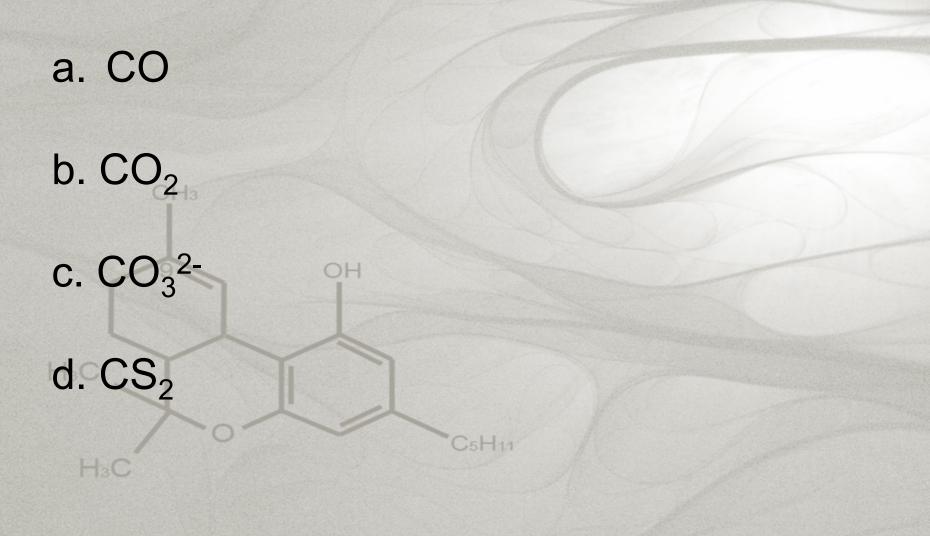
OH

Ans. Option b.

H<sub>3</sub>C



## 44. Anhydride of carbonic acid is





Carbonic acid decomposes to give  $CO_2$  and  $H_2O$ 

 $H_2CO_3 \longrightarrow H_2O + CO_2$ 

