



CHEMISTRY

BOOKS - CENGAGE CHEMISTRY

PERIODIC TABLE

Periodic Table I Mandatory Exercise Exercise Set I

1. Mendeleev arranged the elements in the increasing order of

A. atomic number

B. atomic radius

C. atomic mass

D. valency

Answer: C



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Periodic Table I Mandatory Exercise Exercise Set II

1. Given that the atomic number of X, Y, and Z are 9, 11, and 15, respectively, which of them is an alkali metal?



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2. The number of vertical columns in the periodic table which form the d block is

A. 8

B. 10

C. 12

D. 6

Answer: B



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3. In which group of the periodic table will an element with two electrons in p orbitals be found?

A. Thirteenth

B. Twelfth

C. Fourteenth

D. Fifteenth

Answer: C



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4. The element with the outer electronic configuration $3d^5 4s^1$ is a

A. s-block element

B. transition element

C. lanthanide element

D. actinide element

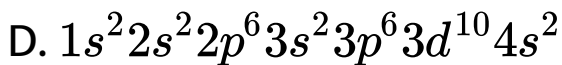
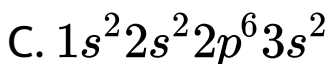
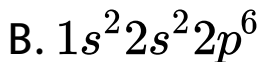
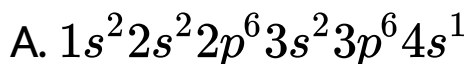
Answer: B



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Periodic Table | Consolidated Exercise Multiple Choice Questions With More Than One Correct Answer

1. The electronic configurations of some elements are given below. Which of these belong to s block of the periodic table?



Answer: A::C::D



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2. Which of the following statements are correct?

A. Group 18 elements are known as noble gases.

B. All the elements belonging to s block are metals.

C. All the elements belonging to d block are metals.

D. Halogens are strong oxidising agents.

Answer: A::B::C::D



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3. Select the correct statements:

A. Ce, Pr, and Nd are f block elements.

B. Cu, Pd, and Ni are d block elements.

C. $Cu([Ar]3d^{10}4s^1)$ and $K([Ar]4s^1)$ have
been placed in s block.

D. Si, Ge, and As are metalloids.

Answer: A::B::D



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Periodic Table I Challenging Exercise

1. A neutral atom has 2 K, 8 L, 8 M, and 2 N electrons. Find the following from this data:

Total number of p electrons



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2. A neutral atom has 2 K, 8 L, 8 M, and 2 N electrons. Find the following from this data:

Total number of s electrons



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3. A neutral atom has 2 K, 8 L, 8 M, and 2 N electrons. Find the following from this data:

Valency of the element



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4. A neutral atom has 2 K, 8 L, 8 M, and 2 N electrons. Find the following from this data:

Total number of protons in the nucleus



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5. The atomic number of an element is 25.

Write its electronic configuration.



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6. The atomic number of an element is 25.

Write the period to which it belongs.



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7. The atomic number of an element is 25.

Write the formula of its oxide.



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8. The atomic number of an element is 25.

Name the type of bond formed when it combines with a 17th group element.



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9. The atomic number of an element is 25.

Write the number of s and p electrons present in it.



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10. The atomic number of an element is 25.

Find the number of unpaired electrons in it.



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11. An element X has three electron shells with six electrons in the valence shell. Predict the following about the element:

Its atomic number



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12. An element X has three electron shells with six electrons in the valence shell. Predict the following about the element:

The period to which it belongs



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13. An element X has three electron shells with six electrons in the valence shell. Predict the following about the element:

The group to which it belongs



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14. An element X has three electron shells with six electrons in the valence shell. Predict the following about the element:

Whether it is a metal or a non-metal



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15. An element X has three electron shells with six electrons in the valence shell. Predict the following about the element:

Formula of its compound with hydrogen



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16. On what basis is potassium ($Z = 19$) placed in the 4th period and 1st group?



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17. Study the table given below and answer the following questions:

Element	<i>P</i>	<i>Q</i>	<i>R</i>
Mass number	23	20	35
Number of neutrons	12	10	18

Write the atomic number and electronic configuration of elements P, Q, and R.



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18. Study the table given below and answer the following questions:

Element	P	Q	R
Mass number	23	20	35
Number of neutrons	12	10	18

To which groups and periods do P, Q, and R belong?



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19. Study the table given below and answer the following questions:

Element	P	Q	R
Mass number	23	20	35
Number of neutrons	12	10	18

Which amongst P, Q, and R is

- (i) I group element (alkali metal)
- (ii) 17th group element (halogen)
- (iii) 18th group element (noble gas)



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20. There are three elements X, Y and Z. Their atomic numbers are 11, 18 and 19 respectively.

Amongst X, Y and Z:

Which elements belong to the same group?



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21. There are three elements X, Y and Z. Their atomic numbers are 11, 18 and 19 respectively.

Amongst X, Y and Z:

Which elements belong to the same period?



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22. There are three elements X, Y and Z. Their atomic numbers are 11, 18 and 19 respectively.

Amongst X, Y and Z:

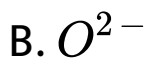
Which element is chemically inactive?



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Periodic Table Ii Mandatory Exercise Exercise Set I

1. Which one of the following is the smallest in size?



Answer: B



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2. In which group of the periodic table would you probably find atoms having the highest ionisation energy?

A. 1

B. 18

C. 14

D. 17

Answer: B



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3. The first ionisation potential of Na, Mg, Al, and Si are in the order of

A. $Na < Mg > Al < Si$

B. $Na > Mg > Al > Si$

C. $Na < Mg < Al < Si$

D. $Na > Mg > Al < Si$

Answer: A



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4. The last member in each period of the periodic table is

A. An inert gas element

B. A transition element

C. A halogen

D. An alkali metal

Answer: A



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5. Fluorine, chlorine, bromine and iodine are placed in the same group (17) of the modern periodic table, because

A. they are non-metals

B. they are electronegative

C. their atoms are generally univalent

D. they have 7 electrons in the outermost shell of their atom.

Answer: D



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6. According to the Mendeleev Periodic law of elements, the variation in properties of elements is related to their

A. Atomic masses

B. Nuclear masses

C. Atomic numbers

D. Nuclear neutron-proton number

Answer: A



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7. Which block of the periodic table contains only metals?

A. s-block

B. d-block

C. both A and B

D. p-block

Answer: C



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8. Chemical property of Li and Mg similar because

A. these belong to same group

B. both ionisation potential is same

C. shows diagonal relationship

D. both electron affinity is same

Answer: C



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9. Whose name is not associated with the development of Periodic Table?

A. Prout's

B. Newlands

C. Rutherford

D. Lothar Meyer

Answer: C



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10. Coinage metals are present in

A. s-block

B. d-block

C. p-block

D. f-block

Answer: B



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11. Which of the following is the atomic number of a metal?

A. 32

B. 34

C. 36

D. 38

Answer: D



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12. The basis of keeping the elements in the group of a modern periodic table is

A. Ionisation potential

B. Electronegativity

C. Electron affinity

D. Number of electrons in the valence shell

Answer: D



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13. Which of these does not reflect the periodicity of the elements?

A. Bonding behaviour

B. Electronegativity

C. Ionisation energy

D. Neutron/proton

Answer: D



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14. The radii of F, F^- , O and O^{2-} are in the order of

A. $O^{2-} > F^- > O > F$

B. $O^{2-} > F^- > F > O$

C. $F^- > O^{2-} > F > O$

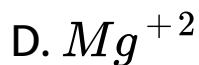
D. $O^{2-} > O > F^- > F$

Answer: A



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15. Which of the following has the largest ionic radius?

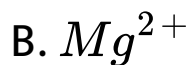


Answer: C



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16. The smallest among the following ions is



Answer: D



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17. The ionic radii of Li^+ , Na^+ , K^+ are in which of the following order

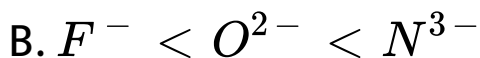


Answer: A



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18. The correct order of radii is



Answer: B



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19. Among the following options, the sequence of increasing first ionisation potential will be

A. $B < C < N$

B. $B > C > N$

C. $C < B < N$

D. $N > C > B$

Answer: A



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20. The set representing the correct order of first ionisation potential is

A. $K > Na > Li$

B. $Be > Mg > Ca$

C. $B > C > N$

D. $Ge > Si > C$

Answer: B



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21. Which among the following species has the highest ionisation potential

A. B

B. C

C. Ne

D. F

Answer: C



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22. The elements which occupy the peaks of ionisation energy curve in a period, are

A. Na, K, Rb, Cs

B. Na, Mg, Cl, I

C. Cl, Br, I, F

D. He, Ne, Ar, Kr

Answer: D



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Periodic Table li Mandatory Exercise Exercise Set li

1. Give scientific reasons.

Chloride ion is larger than chlorine atom.



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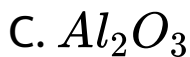
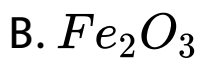
2. Give scientific reasons.

The chemical reactivity of elements of group 1 increases downwards, whereas that of elements of group 17 decreases.



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3. The most basic oxide is



Answer: A



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4. The most electronegative element is

A. fluorine

B. iodine

C. chlorine

D. bromine

Answer: A



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5. Arrange S, P, As in order of increasing ionisation energy

A. $S < P < As$

B. $P < S < As$

C. $As < S < P$

D. $As < P < S$

Answer: D



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6. In view of their low ionisation energies the alkali metals are

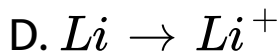
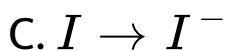
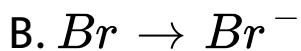
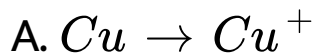
- A. Weak oxidising agents
- B. Strong reducing agents
- C. Strong oxidising agents
- D. Weak reducing agents

Answer: B



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7. In which of the following process highest energy is absorbed



Answer: D



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8. Which one of the following is an incorrect statement?

A. The ionisation potential of nitrogen is greater than that of oxygen.

B. The electron affinity of fluorine is greater than that of chlorine.

C. The ionisation potential of beryllium is greater than that of boron.

D. The electronegativity of fluorine is greater than that of chlorine.

Answer: B



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9. Which of the following elements will have the highest electron affinity?

A. Nitrogen

B. Fluorine

C. Chlorine

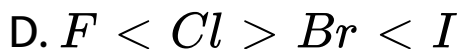
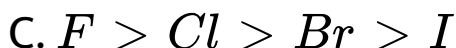
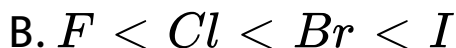
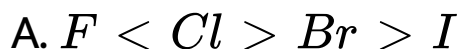
D. Phosphorus

Answer: C



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10. The electron affinity values for the halogens show the following trend



Answer: A



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11. Two elements whose electronegativities are 1.2 and 3.0 the bond formed between them would be

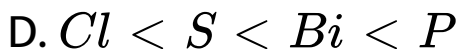
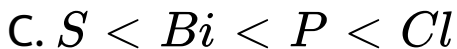
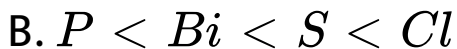
- A. Ionic
- B. Covalent
- C. Coordinate
- D. Metallic

Answer: A



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12. Increasing order of electronegativity is



Answer: A



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13. Going from fluorine to chlorine, bromine and iodine, the electronegativity

A. Increases

B. Decreases

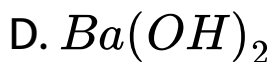
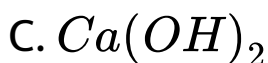
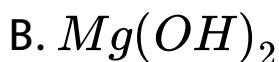
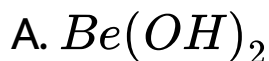
C. First decreases then increases

D. Changes randomly

Answer: B



14. The most basic among these hydroxides, is



Answer: D



15. Which of the following aqueous acid is most acidic?

A. HCl

B. HF

C. HI

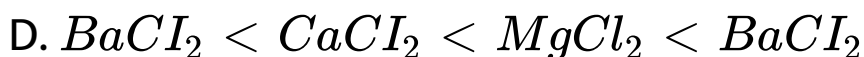
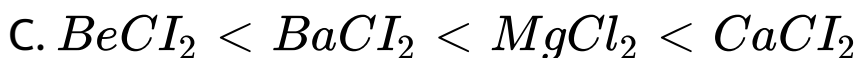
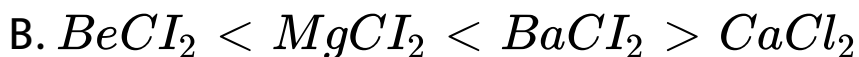
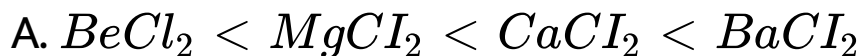
D. HBr

Answer: C



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16. The correct order of the increasing ionic character is

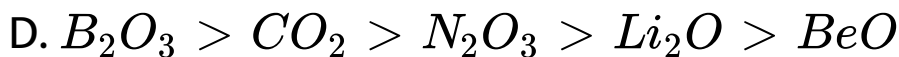
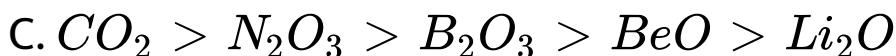
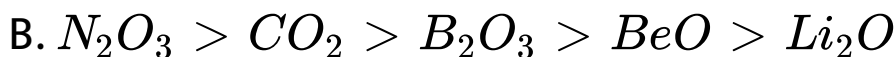
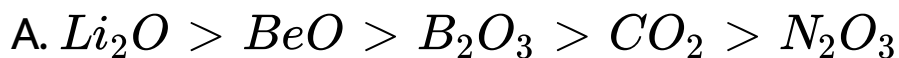


Answer: A



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17. Which of the following sequence correctly represents the decreasing acid nature of oxides?



Answer: B



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18. An element X which occurs in the first short period has an outer electronic structure s^2p^1 .

What are the formula and acid-base character of its oxides

- A. XO_3 , basic
- B. X_2O_3 , Basic
- C. X_2O_3 , Amphoteric
- D. XO_2 , acidic

Answer: C



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19. Which one of the following should be most stable?



Answer: D



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20. Which of the following element does not occur in liquid form?

A. Hg

B. Li

C. Ga

D. Br

Answer: B



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21. Which of the following set has the strongest tendency to form anions?

A. Ga, In and Te

B. Na, Mg and Al

C. N, O and F

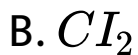
D. V, Cr and Mn

Answer: C



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22. The halogen that most easily reduced is



Answer: A



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23. On going left to right in a period, atomic volumes

A. Decrease

B. Increase

C. Remain same

D. None of these of correct

Answer: A



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24. Which of the following elements is found in native state?

A. Al

B. Au

C. Cu

D. Na

Answer: B



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Periodic Table II Consolidated Exercise

1. Match the following:

Column A	Column B
(1) Horizontal rows	(a) Ionisation energy
(2) Elements with electronic configuration as $ns^2 np^{1-6}$	(b) Valence electrons
(3) Electrons present in the outermost shell	(c) Electron affinity
(4) $M_{(g)} + \text{energy} \longrightarrow M^+_{(g)} + e^-$	(d) p-block elements
(5) $X_{(g)} + e^- \longrightarrow X^-_{(g)} - \text{energy}$	(e) Periods



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Periodic Table II Consolidated Exercise Multiple Choice Questions With One Or More Than One Correct Answer

1. The factors that influence the ionisation energies are

A. the size of the atom

B. the charge on the nucleus

C. the effectiveness of the inner electrons
to screen the nuclear charge

D. the atomic mass

Answer: A::B::C::D



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2. Which of the following properties, in general, decrease on moving from left to right in a period?

- A. Ionisation energy
- B. Electropositive character
- C. Metallic character
- D. Electron affinity

Answer: A::B::C::D



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Periodic Table Ii Challenging Exercise

1. Electron affinities of two elements A and B are given as follows.

$$A = 3.79 \text{ eV} \quad B = 3.56 \text{ eV}$$

Which of them will ionize more easily and why?



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2. Why must a zinc atom absorb more energy than a calcium atom for a 4s electron to get ionised?



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3. Along the period, ionisation energy increases, but the first ionisation energy of Be is more than that of boron, and that of nitrogen is more than that of oxygen. Give reason.





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4. Why is the second ionisation energy for a given element always greater than the first ionisation energy?



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5. Based on general trends, the electron affinity of fluorine would be expected to be greater than that of chlorine, however, the

value is less and is similar to the value of bromine. Explain.



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Periodic Table Ii Olympiad And Ntse Level Exercises

1. Newlands law of octave applies to which of the following set of elements?

A. Be, Mg, Ca

B. As, K, Ca

C. B,N,C

D. None of these

Answer: A



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2. The elements of group 1, 2, 13, 14, 15, 16, 17, 18 are collectively called

A. Noble elements

B. Typical elements

C. Transition elements

D. Representative elements

Answer: D



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3. The 3rd period of the periodic table contains

A. 8 elements

B. 32 elements

C. 3 elements

D. 18 elements

Answer: A



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4. The correct order of the size of C, N, P and S

is

A. $N < S < P < S$

B. $C < N < P < S$

$$\text{C. } N < C < S < P$$

$$\text{D. } C < N < S < P$$

Answer: C



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5. Anything that influences the valence electrons will affect the chemistry of the element. Which one of the following factors does not affect the valence shell?

A. Valence principal quantum number (n)

B. Nuclear charge (Z)

C. Nuclear mass

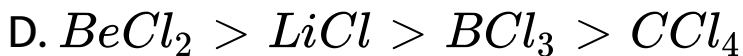
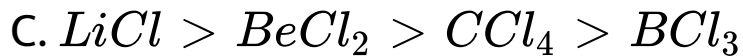
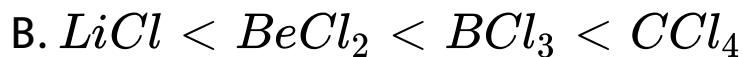
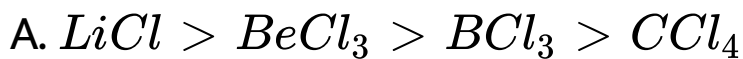
D. Number of core electrons

Answer: C



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6. Among $LiCl$, $BeCl_2$, BCl_3 and CCl_4 the covalent bond character follows the order

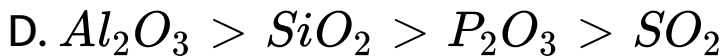
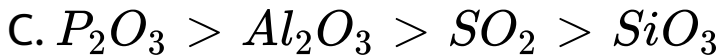
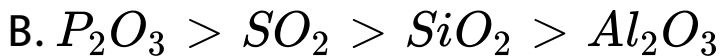
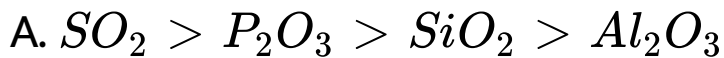


Answer: B



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7. The correct order of acidic strength of the following is

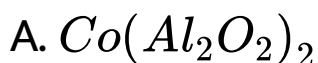


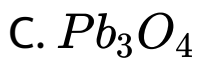
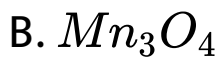
Answer: A



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8. Which of the oxides is not a mixed oxide?





Answer: D



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