

Ionisation energy

1. The incorrect statement among the following is
 - (a) The first ionisation potential of Al is less than the first ionisation potential of Mg
 - (b) The second ionisation potential of Mg is greater than the second ionisation potential of Na
 - (c) The first ionisation potential of Na is less than the first ionisation potential of Mg
 - (d) The third ionisation potential of Mg is greater than the third ionisation potential of Al
2. The second ionisation potential of an element M is the energy required to
 - (a) Remove one mole of electron from one mole of gaseous anion
 - (b) Remove one mole of electron from one mole of gaseous cation of the element
 - (c) Remove one mole of electron from one mole of monovalent gaseous cation of the element
 - (d) Remove 2 moles of electrons from one mole of gaseous atoms
3. The ionization energy of an element is
 - (a) The same as the electron affinity of the element
 - (b) Equal in magnitude but of opposite sign to the electron affinity of the element
 - (c) The energy released when an electron is added to an atom of the element
 - (d) The energy required to remove the outermost electron of an atom of the element
4. The first ionisation energies of alkaline earth metals are higher than those of the alkali metals. This is because
 - (a) There is increase in the nuclear charge of the alkaline earth metals
 - (b) There is a decrease in the nuclear charge of the alkaline earth metals
 - (c) There is no change in the nuclear charge
 - (d) None of the above
5. The statement that is not correct for the periodic classification of elements is
 - (a) The properties of elements are the periodic functions of their atomic numbers
 - (b) Non-metallic elements are lesser in number than metallic elements
 - (c) The first ionisation energies along a period do not vary in a regular manner with increase in atomic number



- (d) For transition elements the d -sub-shells are filled with electrons monotonically with increase in atomic number
6. Choose the correct statement
- Ionization energy and electron affinity increases across a period
 - Ionization energy increases but electron affinity decreases along a period
 - Ionization energy decreases but electron affinity increases
 - Both decreases along a period
7. In halogens, with the increase of atomic number which habit is found
- Habit to loose electrons decreases
 - Ionic radii decreases
 - Ionization potential decreases
 - In MX_2 (M = metal and X = halogen), covalent properties decreases
8. Ionization potential is lowest for
- Halogens
 - Inert gases
 - Alkaline earth metals
 - Alkali metals
9. Which of the following explanation is best for not placing hydrogen in either the group of alkali metals or halogens
- The ionization energy of hydrogen is too high for group of alkali metals, but too low of halogen group
 - Hydrogen can form compounds with all other elements
 - Hydrogen is much lighter element than the alkali metals or the halogens
 - None of the above
10. The ionization energy of nitrogen is more than that of oxygen because
- Nitrogen has half filled p -orbitals
 - Nitrogen is left to the oxygen in the same period of the periodic table
 - Nitrogen contains less number of electrons
 - Nitrogen is less electronegative
11. The energy required to remove an electron of a gaseous atom from its ground state is called
- Potential energy
 - Ionization energy
 - Electrode potential
 - Activation energy
12. The first ionization energy of boron is less than that of beryllium because
- Boron has higher nuclear charge
 - Atomic size of boron is more than that of beryllium
 - Boron has only one electron in p -sub-shell



- (d) Atomic size of boron is less than that of beryllium
13. $A \rightarrow A^+ + e, E_1$ and $A^+ \rightarrow A^{2+} + e, E_2$.
The energy required to pull out the two electrons are E_1 and E_2 respectively. The correct relationship between two energy would be
(a) $E_1 < E_2$ (b) $E_1 = E_2$
(c) $E_1 > E_2$ (d) $E_1 \neq E_2$
14. Which of the following element has maximum, first ionisation potential
(a) *V* (b) *Ti*
(c) *Cr* (d) *Mn*
15. Highest energy will be absorbed to eject out the electron in the configuration
(a) $1s^2 2s^2 2p^1$ (b) $1s^2 2s^2 2p^3$
(c) $1s^2 2s^2 2p^2$ (d) $1s^2 2s^2 2p^4$
16. In which of the following process highest energy is absorbed
(a) $Cu \rightarrow Cu^+$ (b) $Br \rightarrow Br^-$
(c) $I \rightarrow I^-$ (d) $Li \rightarrow Li^+$
17. The first ionization potential of *Na*, *Mg*, *Al* and *Si* are in the order
(a) $Na < Mg > Al < Si$
(b) $Na > Mg > Al > Si$
(c) $Na < Al < Mg < Si$
(d) $Na > Mg > Al < Si$
18. How many ionisation energies can carbon have
(a) 1 (b) 2
(c) 4 (d) 6
19. Which of the following gaseous atoms has highest value of *IE*
(a) *P* (b) *Si*
(c) *Mg* (d) *Al*
20. Hydrogen has high ionization energy than alkali metals, due to its
(a) Large size
(b) Small size
(c) Ionic bond
(d) Covalent bond
21. The first ionization potentials (*eV*) of *Be* and *B* respectively are
(a) 8.29eV, 9.32eV
(b) 9.32eV, 9.32eV
(c) 8.29eV, 8.29eV
(d) 9.32eV, 8.29eV
22. Which ionisation potential (*IP*) in the following equations involves the greatest amount of energy
(a) $Na \rightarrow Na^+ + e^-$
(b) $K^+ \rightarrow K^{2+} + e^-$
(c) $C^{2+} \rightarrow C^{3+} + e^-$
(d) $Ca^+ \rightarrow Ca^{2+} + e^-$
23. Which of the following has maximum ionization potential
(a) *K* (b) *Na*



- (c) *Al* (d) *Mg* (a) $[Ne]3s^23p^1$
(b) $[Ne]3s^23p^2$
24. The first four ionization energy values of an element are 191, 578, 872 and 5962 *kcal*. The number of valence electrons in the element is (c) $[Ne]3s^23p^3$
(d) $[Ar]3d^{10}4s^24p^2$
(a) 1 (b) 2 30. Which of the following elements has the lowest ionisation potential
(c) 3 (d) 4 (a) *N* (b) *O*
(c) *F* (d) *Ne*
25. Which of the following has least ionization potential
(a) *Li* (b) *Cs*
(c) *Cl* (d) *I*
26. Which of the following element has the lowest ionization potential
(a) *Fe* (b) *H*
(c) *Li* (d) *He*
27. As one moves along a given row in the periodic table, ionization energy
(a) Remains same
(b) Increases from left to right
(c) First increases, then decreases
(d) Decreases from left to right
28. Ionization energy is highest for
(a) Noble gases
(b) Platinum metals
(c) Transition elements
(d) Inner-transition elements
29. Which one of the following elements has the highest ionisation energy



