

Periodicity - Periodic Properties, Atomic Radius

1. Atomic radius depends upon

- 1) Oxidation number
- 2) Nature of Bonding
- 3) Bond order
- 4) All of These

2. When a neutral atom is converted into cation, there is

- 1) A decrease in atomic number
- 2) An increase in atomic number
- 3) A decrease in size
- 4) An increase in size

3. When compared to a neutral atom its anion is

- 1) Smaller in size
- 2) May be smaller and larger in size
- 3) Larger in size
- 4) None of these

4. In a period of representative elements, the decrease in ionic radius when compared with the corresponding decrease in atomic radius

- 1) Is equal
- 2) Is less
- 3) Is more
- 4) Cannot be predicted

5. In which of the following sets, elements have nearly same atomic radii?

- 1) Li, Be, B
- 2) Mg, Ca, Sr
- 3) Fe, Co, Ni
- 4) O, S, Se

6. Correct order of atomic radii is

- 1) N < C < P < S
- 2) C < N < S < P
- 3) C < N < P < S
- 4) N < C < S < P

7. If an element 'X' is assumed to have the types of radii, then their order is

- 1) Crystal radius > Van der Waals radius > Covalent radius
- 2) Van der Waals radius > Crystal radius > Covalent radius
- 3) Covalent radius > Crystal radius > Van der Waals radius

- 4) Van der Waals radius > Covalent radius > Crystal radius
- 8. The correct order of variation in the sizes of atoms is**
- 1) Be>C>F>Ne 2) Be<C<F<Ne 3) Be>C>F<Ne 4) F> Ne > Be >C
- 9. Atomic radii of fluorine atom and neon atom in angstrom units are respectively**
- 1) 0.762, 1.60 2) 1.60, 1.60 3) 0.72, 0.72 4) 1.60, 0.762
- 10. Which one is the correct order of the size of the iodine species?**
- 1) I > I⁺ > I⁻ 2) I > I⁻ > I⁺ 3) I⁺ > I⁻ > I 4) I⁻ > I > I⁺
- 11. Vander Waal's radius is used for**
- 1) Molecular substances in gaseous state only
2) Molecular substances in liquid state only
3) Molecular substances in solid state only
4) Molecular substances in any state
- 12. The covalent and Van der waal's radii of chlorine respectively are**
- 1) 1.56 A⁰ & 0.99 A⁰ 2) 0.99 A⁰ & 1.56 A⁰
3) 1.56 A⁰ & 1.56 A⁰ 4) 0.99A⁰ & 0.99 A⁰
- 13. The size of Zr is closest to**
- 1) La 2) Hf 3) Ta 4) W
- 14. The radii of F, F⁻, O and O²⁻ are in the order**
- 1) O²⁻>F>O>F 2) O²⁻>F>F>O 3) F⁻> O²⁻> F>O 4) O²⁻>O>F>F
- 15. Which one of the following has the largest radius?**
- 1) Be²⁺ 2) Mg²⁺ 3) Ba²⁺ 4) Ca²⁺
- 16. O²⁻ and Al³⁺are isoelectronic ions. If the ionic radius of O²⁻ is 1A⁰, the ionic radius of Al³⁺ will be**
- 1) 1.4A⁰ 2) 0.41A⁰ 3) 2.8A⁰ 4) 1.5A⁰

17. Na^+ , Mg^{2+} , Al^{3+} , and Si^{4+} are isoelectronic ions. Their ionic size will follow the order

1) $\text{Na}^+ < \text{Mg}^{2+} < \text{Al}^{3+} < \text{Si}^{4+}$

2) $\text{Na}^+ > \text{Mg}^{2+} < \text{Al}^{3+} < \text{Si}^{4+}$

3) $\text{Na}^+ < \text{Mg}^{2+} > \text{Al}^{3+} > \text{Si}^{4+}$

4) $\text{Na}^+ > \text{Mg}^{2+} > \text{Al}^{3+} > \text{Si}^{4+}$

18. The atomic radius decreases in a period due to

1) Increase in nuclear attraction 2) Decrease in nuclear attraction

3) Increase in number of electrons 4) Decrease in number of electrons

19. The order of decrease in atomic radii for Be, Na & Mg is

1) $\text{Na} > \text{Mg} > \text{Be}$ 2) $\text{Mg} > \text{Na} > \text{Be}$ 3) $\text{Be} > \text{Na} > \text{Mg}$ 4) $\text{Be} > \text{Mg} > \text{Na}$

20. The covalent radius of Chlorine is 1.9\AA^0 . The bond length in Cl_2 molecule is

1) 0.19\AA^0 2) 3.80\AA^0 3) 2.85\AA^0 4) 0.95\AA^0

21. In which of the following pairs, the first atom or ion has smaller size than the second?

1) $\text{Fe}^{2+}, \text{Fe}^{3+}$ 2) S, Cl 3) P, N 4) Cl, Cl^-

22. In the isoelectronic species the ionic radii of N^{3-} , O^{2-} , F^- are respectively in

1) 1.36, 1.40, 1.71 2) 1.36, 1.71, 1.40 3) 1.71, 1.40, 1.36 4) 1.71, 1.36, 1.40

23. In a given period, atomic radius is largest for

1) Chalcogen 2) Alkali metal 3) Aerogen 4) Halogen

24. Among elements with the following electronic configurations, the one with the largest radius is

1) $[\text{Ne}] 3s^2$ 2) $[\text{Ne}] 3s^2 3p^1$ 3) $[\text{Ne}] 3s^2 3p^3$ 4) $[\text{Ne}] 3s^2 3p^5$

25. The smallest species among the following is

1) Sodium ion 2) Lithium ion 3) Chloride ion 4) Fluoride ion

26. A: Al³⁺ has smaller ionic radius than Mg²⁺.

R: Al³⁺ has higher effective nuclear charge than Mg²⁺.

- 1) Both A and R are true and R correct explanation to A.
- 2) Both A and R are true but R is not correct explanation to A.
- 3) A is true and R is false.
- 4) A is false and R is true.

27. Which of the following statement is correct?

- 1) X⁺ ion is larger than X⁻.
- 2) X⁻ ion is larger than X.
- 3) X⁺ and X⁻ ions have same size.
- 4) X⁺ ion is larger than n X.

28. The radius of the La³⁺ (atomic number of La = 57) is 1.06A⁰. Which one of the following given values will be closest to the radius of Lu³⁺ (atomic number of Lu = 71)

- 1) 0.85A⁰
- 2) 1.60A⁰
- 3) 1.40A⁰
- 4) 1.06A⁰

29. The ionic radius of S is minimum, in which of the following compounds

- 1) SO₂
- 2) H₂SO₄
- 3) H₂S
- 4) SCl₄

30. The Lanthanide contraction relates to

- 1) Oxidation states
- 2) Magnetic state
- 3) Atomic radii
- 4) Valence electrons

KEY

1)4 2) 3 3) 3 4)3 5) 3 6) 4 7)2 8)3 9)1 10)4

11)3 12)2 13)2 14)1 15) 3 16) 2 17)4 18)1 19)1 20)2

21) 4 22)3 23)2 24)1 25)2 26)1 27)2 28)1 29)2 30)3