

Chapter 8

1. The general electron configuration for atoms of all elements in Group 5A is

- A. ns^2np^6 .
- B. ns^2np^5 .
- C. ns^2np^4 .
- D. ns^2np^3 .
- E. ns^2np^1 .

2. The general electron configuration for atoms of the halogen group is

- A. ns^2np^6 .
- B. ns^2np^5 .
- C. $ns^2np^6(n-1)d^7$.
- D. ns^1 .
- E. ns^2np^7 .

3. In what group of the periodic table is the element with the electron configuration $[Ar]4s^23d^{10}4p^3$?

- A. 1A
- B. 2A
- C. 3A
- D. 4A
- E. 5A

4. How many *valence electrons* does a carbon atom have?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 6

5. What is the charge on the monatomic ion that calcium forms in its compounds?

- A. +2
- B. +1
- C. -1
- D. -2
- E. -3

6. What is the charge on the monatomic ion of nitrogen, the nitride ion?

- A. +2
- B. +1
- C. -1
- D. -2
- E. -3

7. Which of these species make an *isoelectronic pair*: Cl^- , O^{2-} , F , Ca^{2+} , Fe^{3+} ?

- A. Ca^{2+} and Fe^{3+}
- B. O^{2-} and F
- C. F and Cl^-
- D. Cl^- and Ca^{2+}
- E. none of these

8. Which of these pairs consists of *isoelectronic species*?

- A. Mn^{2+} and Ar
- B. Zn^{2+} and Cu^{2+}
- C. Na^+ and K^+
- D. Cl^- and S
- E. K^+ and Cl^-

9. Which ion is *isoelectronic* with Ar ?

- A. Fe^{2+}
- B. F^-
- C. Br^-
- D. Ga^{3+}
- E. Ca^{2+}

10. Which of these choices is the electron configuration for the aluminum ion?

- A. $1s^2 2s^2 2p^6 3s^2$
- B. $1s^2 2s^2 2p^6 3s^2 3p^2$
- C. $1s^2 2s^2 2p^6 3s^2 3p^1$
- D. $1s^2 2s^2 2p^6$
- E. $1s^2 2s^2 2p^6 3s^2 3p^4$

11. Which of these choices is the electron configuration for the chloride ion?

- A. $[\text{Ne}]3s^2 3p^4$
- B. $[\text{Ne}]3s^2 3p^7$
- C. $[\text{Ar}]$
- D. $[\text{Ar}]4s^1$
- E. $[\text{Ne}]3s^2 3p^5$

12. Which of these choices is the electron configuration of the iron(III) ion?

- A. $[\text{Ar}]3d^5$
- B. $[\text{Ar}]4s^1 3d^5$
- C. $[\text{Ar}]4s^2 3d^3$
- D. $[\text{Ar}]3d^6$
- E. $[\text{Ar}]4s^2 3d^9$

13. The electron configuration of a cobalt(III) ion is

- A. $[\text{Ar}]3d^5$.
- B. $[\text{Ar}]4s^1 3d^5$.
- C. $[\text{Ar}]4s^2 3d^4$.
- D. $[\text{Ar}]3d^6$.
- E. $[\text{Ar}]4s^2 3d^9$.

14. The sulfide ion, S^{2-} , is isoelectronic with which one of the following?

- A. O^{2-}
- B. F^-
- C. Na^+
- D. Al^{3+}
- E. K^+

15. Which one of these ions does *not* have [Kr] as its electronic configuration?

- A. Se^{2-}
- B. Br^-
- C. Rb^+
- D. Y^{3+}
- E. Zn^{2+}

16. The cobalt(III) ion, Co^{3+} , has how many 3d electrons?

- A. 0
- B. 7
- C. 6
- D. 5
- E. 4

17. Which of these ground-state ions has the largest number of unpaired electrons?

- A. Cr^{2+}
- B. Mn^{2+}
- C. Ni^{2+}
- D. Cu^+
- E. Co^{2+}

18. Which of these atoms has the smallest radius?

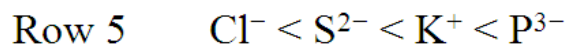
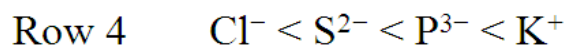
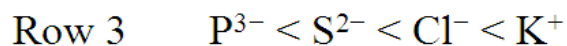
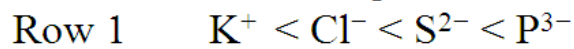
- A. Al
- B. P
- C. As
- D. Te
- E. Na

19. Which of these atoms has the largest radius?

- A. B
- B. Ga
- C. Br
- D. Si
- E. Cl

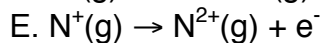
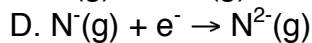
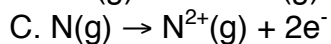
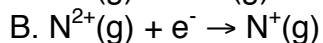
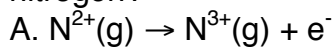
20. Arrange these ions in order of increasing ionic radius: K^+ , P^{3-} , S^{2-} , Cl^- .

Increasing radius \rightarrow



- A. Row 1
- B. Row 2
- C. Row 3
- D. Row 4
- E. Row 5

21. For which of these reactions is the enthalpy change equal to the second ionization energy of nitrogen?



22. Which of these elements has the highest first ionization energy?

- A. Cs
- B. Ga
- C. K
- D. Bi
- E. As

23. Which of these elements has the smallest first ionization energy?

- A. Cl
- B. Na
- C. Be
- D. K
- E. As

24. Which of these elements has the greatest electron affinity (largest positive value)?

- A. Mg
- B. Al
- C. Si
- D. P
- E. S

25. Which of these elements has the greatest electron affinity (largest positive value)?

- A. K
- B. Br
- C. As
- D. Ar
- E. I

Chapter 8 Key

1. D
2. B
3. E
4. D
5. A
6. E
7. D
8. E
9. E
10. D
11. C
12. A
13. D
14. E
15. E
16. C
17. B
18. B
19. B
20. A
21. E
22. E
23. D
24. E
25. B