

Chemical Bonding - Practice Questions

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. What is the name given to the electrons in the highest occupied energy level of an atom?
- orbital electrons
 - valence electrons
 - anions
 - cations
- _____ 2. How does calcium obey the octet rule when reacting to form compounds?
- It gains electrons.
 - It gives up electrons.
 - It does not change its number of electrons.
 - Calcium does not obey the octet rule.
- _____ 3. What is the charge on the strontium ion?
- 2-
 - 1-
 - 1+
 - 2+
- _____ 4. How many electrons does barium have to give up to achieve a noble-gas electron configuration?
- 1
 - 2
 - 3
 - 4
- _____ 5. What is the formula of the ion formed when potassium achieves noble-gas electron configuration?
- K^{2+}
 - K^+
 - K^{1-}
 - K^{2-}
- _____ 6. Which of the following ions has a pseudo-noble-gas electron configuration?
- Fe^{2+}
 - Mn^{2+}
 - Cu^+
 - Ni^+
- _____ 7. Which of the following elements does NOT form an ion with a charge of 1+?
- fluorine
 - hydrogen
 - potassium
 - sodium
- _____ 8. What is the charge on the cation in the ionic compound sodium sulfide?
- 0
 - 1+
 - 2+
 - 3+
- _____ 9. Which of the following occurs in an ionic bond?
- Oppositely charged ions attract.
 - Two atoms share two electrons.
 - Two atoms share more than two electrons.
 - Like-charged ions attract.
- _____ 10. What is the net charge of the ionic compound calcium fluoride?
- 2-
 - 1-
 - 0
 - 1+

- _____ 11. How many valence electrons are transferred from the nitrogen atom to potassium in the formation of the compound potassium nitride?
a. 0
b. 1
c. 2
d. 3
- _____ 12. How many valence electrons are transferred from the calcium atom to iodine in the formation of the compound calcium iodide?
a. 0
b. 1
c. 2
d. 3
- _____ 13. What is the formula unit of sodium nitride?
a. NaN
b. Na₂N
c. Na₃N
d. NaN₃
- _____ 14. What is the formula unit of aluminum oxide?
a. AlO
b. Al₃O
c. AlO₃
d. Al₂O₃
- _____ 15. What is the name of the ionic compound formed from lithium and bromine?
a. lithium bromine
b. lithium bromide
c. lithium bromium
d. lithium bromate
- _____ 16. What is the formula for sodium sulfate?
a. NaSO₄
b. Na₂SO₄
c. Na(SO₄)₂
d. Na₂(SO₄)₂
- _____ 17. What is the formula for potassium sulfide?
a. KS
b. K₂S
c. KS₂
d. K₂S₂
- _____ 18. Which of the following pairs of elements is most likely to form an ionic compound?
a. magnesium and fluorine
b. nitrogen and sulfur
c. oxygen and chlorine
d. sodium and aluminum
- _____ 19. Which of these elements does not exist as a diatomic molecule?
a. Ne
b. F
c. H
d. I
- _____ 20. How do atoms achieve noble-gas electron configurations in single covalent bonds?
a. One atom completely loses two electrons to the other atom in the bond.
b. Two atoms share two pairs of electrons.
c. Two atoms share two electrons.
d. Two atoms share one electron.
- _____ 21. Why do atoms share electrons in covalent bonds?
a. to become ions and attract each other
b. to attain a noble-gas electron configuration
c. to become more polar
d. to increase their atomic numbers

- _____ 22. Which of the following elements can form diatomic molecules held together by triple covalent bonds?
- carbon
 - oxygen
 - fluorine
 - nitrogen
- _____ 23. Which of the following is the name given to the pairs of valence electrons that do not participate in bonding in diatomic oxygen molecules?
- unvalenced pair
 - outer pair
 - inner pair
 - unshared pair
- _____ 24. Which of the following diatomic molecules is joined by a double covalent bond?
- O₂
 - Cl₂
 - N₂
 - He₂
- _____ 25. A molecule with a single covalent bond is _____.
- CO₂
 - Cl₂
 - CO
 - N₂
- _____ 26. Once formed, how are coordinate covalent bonds different from other covalent bonds?
- They are stronger.
 - They are more ionic in character.
 - They are weaker.
 - There is no difference.
- _____ 27. When H⁺ forms a bond with H₂O to form the hydronium ion H₃O⁺, this bond is called a coordinate covalent bond because _____.
- both bonding electrons come from the oxygen atom
 - it forms an especially strong bond
 - the electrons are equally shared
 - the oxygen no longer has eight valence electrons
- _____ 28. Which of the following atoms acquires the most negative charge in a covalent bond with hydrogen?
- C
 - Na
 - O
 - S
- _____ 29. Which of the following covalent bonds is the most polar?
- H—F
 - H—C
 - H—H
 - H—N
- _____ 30. What causes hydrogen bonding?
- attraction between ions
 - motion of electrons
 - sharing of electron pairs
 - bonding of a covalently bonded hydrogen atom with an unshared electron pair
- _____ 31. Why is hydrogen bonding only possible with hydrogen?
- Hydrogen's nucleus is electron deficient when it bonds with an electronegative atom.
 - Hydrogen is the only atom that is the same size as an oxygen atom.
 - Hydrogen is the most electronegative element.
 - Hydrogen tends to form covalent bonds.

Chemical Bonding - Practice Questions Answer Section

MULTIPLE CHOICE

1.	ANS: B	PTS: 1	DIF: L1	REF: p. 187
	OBJ: 7.1.1	STA: Ch.1.c Ch.2.a		
2.	ANS: B	PTS: 1	DIF: L1	REF: p. 188
	OBJ: 7.1.1	STA: Ch.1.c Ch.2.a		
3.	ANS: D	PTS: 1	DIF: L1	REF: p. 190
	OBJ: 7.1.2	STA: Ch.1.c Ch.2.g		
4.	ANS: B	PTS: 1	DIF: L1	REF: p. 190
	OBJ: 7.1.3	STA: Ch.1.c Ch.2.a Ch.1.d		
5.	ANS: B	PTS: 1	DIF: L1	REF: p. 190
	OBJ: 7.1.3	STA: Ch.3.a		
6.	ANS: C	PTS: 1	DIF: L1	REF: p. 190
	OBJ: 7.1.3	STA: Ch.1.g		
7.	ANS: A	PTS: 1	DIF: L1	REF: p. 190
	OBJ: 7.1.3	STA: Ch.1.g		
8.	ANS: B	PTS: 1	DIF: L1	REF: p. 194
	OBJ: 7.2.1	STA: Ch.2.a		
9.	ANS: A	PTS: 1	DIF: L1	REF: p. 194
	OBJ: 7.2.1	STA: Ch.2.a		
10.	ANS: C	PTS: 1	DIF: L1	REF: p. 194
	OBJ: 7.2.1	STA: Ch.3.a		
11.	ANS: A	PTS: 1	DIF: L2	REF: p. 194
	OBJ: 7.2.1	STA: Ch.2.a		
12.	ANS: C	PTS: 1	DIF: L2	REF: p. 194
	OBJ: 7.2.1	STA: Ch.2.a		
13.	ANS: C	PTS: 1	DIF: L2	REF: p. 195
	OBJ: 7.2.1	STA: Ch.3.a		
14.	ANS: D	PTS: 1	DIF: L2	REF: p. 195
	OBJ: 7.2.1	STA: Ch.3.a		
15.	ANS: B	PTS: 1	DIF: L2	REF: p. 192 p. 195
	OBJ: 7.2.1	STA: Ch.2.a		
16.	ANS: B	PTS: 1	DIF: L2	REF: p. 192 p. 195
	OBJ: 7.2.1	STA: Ch.3.a		
17.	ANS: B	PTS: 1	DIF: L2	REF: p. 192 p. 195
	OBJ: 7.2.1	STA: Ch.3.a		
18.	ANS: A	PTS: 1	DIF: L3	REF: p. 194
	OBJ: 7.2.1	STA: Ch.2.a		
19.	ANS: A	PTS: 1	DIF: L1	REF: p. 217
	OBJ: 8.2.1	STA: Ch.2.a		
20.	ANS: C	PTS: 1	DIF: L2	REF: p. 217
	OBJ: 8.2.1	STA: Ch.2.a		

21.	ANS: B	PTS: 1	DIF: L2	REF: p. 217
	OBJ: 8.2.1	STA: Ch.2.a		
22.	ANS: D	PTS: 1	DIF: L2	REF: p. 221
	OBJ: 8.2.1	STA: Ch.2.a		
23.	ANS: D	PTS: 1	DIF: L1	REF: p. 218
	OBJ: 8.2.2	STA: Ch.2.a		
24.	ANS: A	PTS: 1	DIF: L2	REF: p. 221
	OBJ: 8.2.3	STA: Ch.2.a		
25.	ANS: B	PTS: 1	DIF: L2	REF: p. 222
	OBJ: 8.2.1 8.2.4	STA: Ch.2.a		
26.	ANS: D	PTS: 1	DIF: L2	REF: p. 223
	OBJ: 8.2.4	STA: Ch.2.a		
27.	ANS: A	PTS: 1	DIF: L2	REF: p. 225
	OBJ: 8.2.4	STA: Ch.2.a		
28.	ANS: C	PTS: 1	DIF: L2	REF: p. 238 p. 239
	OBJ: 8.4.1	STA: Ch.2.a		
29.	ANS: A	PTS: 1	DIF: L3	REF: p. 238 p. 239
	OBJ: 8.4.1	STA: Ch.2.a		
30.	ANS: D	PTS: 1	DIF: L2	REF: p. 241
	OBJ: 8.4.3	STA: Ch.2.a		
31.	ANS: A	PTS: 1	DIF: L2	REF: p. 241
	OBJ: 8.4.1 8.4.3	STA: Ch.2.a		