

Bonding practice lessons 1-3

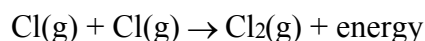
1. As two chlorine atoms combine to form a molecule, energy is

- A) absorbed **B) released**
C) created D) destroyed

2. When a chemical bond is broken, energy is

- A) absorbed, only**
B) released, only
C) both absorbed and released
D) neither absorbed nor released

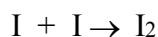
3. Given the reaction:



Which statement best describes the reaction?

- A) A bond is formed and energy is absorbed.
B) A bond is formed and energy is released.
C) A bond is broken and energy is absorbed.
D) A bond is broken and energy is released.

4. Given the equation:



As the atoms of the iodine react to form molecules of iodine, the stability of the iodine

- A) decreases **B) increases**
C) remains the same

5. Which properties are characteristic of the Group 1 metals?

- A) high reactivity and the formation of stable compounds**
B) high reactivity and the formation of unstable compounds
C) low reactivity and the formation of stable compounds
D) low reactivity and the formation of unstable compounds

6. Based on electronegativity values, which type of elements tends to have the greatest attraction for electrons in a bond?

- A) metals B) metalloids
C) nonmetals D) noble gases

7. Which element has atoms with the greatest attraction for electrons in a chemical bond?

- A) beryllium **B) fluorine**
C) lithium D) oxygen

8. If the electronegativity difference between the elements in compound NaX is 2.1, what is element X ?

- A) bromine** B) chlorine
C) fluorine D) oxygen

9. An element with an electronegativity of 0.9 bonds with an element with an electronegativity of 3.1. Which phrase best describes the bond between these elements?

- A) mostly ionic in character and formed between two nonmetals
B) mostly ionic in character and formed between a metal and a nonmetal
C) mostly covalent in character and formed between two nonmetal
D) mostly covalent in character and formed between a metal and a nonmetal

10. Two atoms with an electronegativity difference of 0.4 form a bond that is

- A) ionic, because electrons are shared
B) ionic, because electrons are transferred
C) covalent, because electrons are shared
D) covalent, because electrons are transferred

11. Which compound would most likely have the greatest ionic character?

- A) CO **B) KF** C) CaO D) LiH

12. Which substance contains bonds that involved the transfer of electrons from one atom to another?

- A) CO_2 B) NH_3 **C) KBr** D) Cl_2

13. Which type of bond is found in sodium bromide?

- A) covalent B) hydrogen
C) ionic D) metallic

14. Compared to a calcium atom, the calcium ion Ca^{2+} has

- A) more protons B) fewer protons
C) more electrons **D) fewer electrons**

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15. Which type of bond results when one or more valence electrons are transferred from one atom to another?

- A) a hydrogen bond
B) an ionic bond
 C) a nonpolar covalent bond
 D) a polar covalent bond

16. Which compound contains both ionic and covalent bonds?

- A) CaCO_3 B) PCl_3
 C) MgF_2 D) CH_2O

17. The data table below represents the properties determined by the analysis of substances *A*, *B*, *C*, and *D*.

Substance	Melting Point ($^{\circ}\text{C}$)	Boiling Point ($^{\circ}\text{C}$)	Conductivity
<i>A</i>	-80	-20	none
<i>B</i>	20	190	none
<i>C</i>	320	770	as solid
<i>D</i>	800	1250	in solution

Which substance is an ionic compound?

- A) *A* B) *B* C) *C* **D) *D***

18. A substance that has a melting point of 1074 K conducts electricity when dissolved in water, but does *not* conduct electricity in the solid phase. The substance is most likely

- A) an ionic solid** B) a network solid
 C) a metallic solid D) a molecular solid

19. Which type of bonding is found in all molecular substances?

- A) covalent bonding** B) hydrogen bonding
 C) ionic bonding D) metallic bonding

20. In which compound do atoms form bonds by sharing electrons?

- A) H_2O** B) Na_2O C) CaO D) MgO

21. A chemist performs the same tests on two homogeneous white crystalline solids, *A* and *B*. The results are shown in the table below.

	Solid A	Solid B
Melting Point	High, 801°C	Low, decomposes at 186°C
Solubility in H_2O (grams per 100.0 g H_2O at 0°C)	35.7	3.2
Electrical Conductivity (in aqueous solution)	Good conductor	Nonconductor

The results of these tests suggest that

- A) both solids contain only ionic bonds
 B) both solids contain only covalent bonds
 C) solid *A* contains only covalent bonds and solid *B* contains only ionic bonds
D) solid *A* contains only ionic bonds and solid *B* contains only covalent bonds

22. The bonds between hydrogen and oxygen in a water molecule are classified as

- A) polar covalent** B) nonpolar covalent
 C) ionic D) metallic

23. Which of these formulas contains the most polar bond?

- A) H-Br B) H-Cl **C) H-F** D) H-I

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24. Which type of bond exists between an atom of carbon and an atom of fluorine?

- A) ionic B) metallic
C) **polar covalent** D) nonpolar covalent

25. The electrons in a bond between two iodine atoms (I_2) are shared

- A) equally, and the resulting bond is polar
B) **equally, and the resulting bond is nonpolar**
C) unequally, and the resulting bond is polar
D) unequally, and the resulting bond is nonpolar

26. Which combination of atoms can form a polar covalent bond?

- A) H and H B) **H and Br**
C) N and N D) Na and Br

27. Which substance contains metallic bonds?

- A) **Hg(ℓ)** B) H₂O(ℓ)
C) NaCl(s) D) C₆H₁₂O₆(s)
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Answer Key
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1. **B**
 2. **A**
 3. **B**
 4. **B**
 5. **A**
 6. **C**
 7. **B**
 8. **A**
 9. **B**
 10. **C**
 11. **B**
 12. **C**
 13. **C**
 14. **D**
 15. **B**
 16. **A**
 17. **D**
 18. **A**
 19. **A**
 20. **A**
 21. **D**
 22. **A**
 23. **C**
 24. **C**
 25. **B**
 26. **B**
 27. **A**
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