

## Bonding practice lessons 1-3

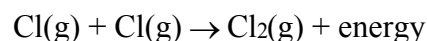
1. As two chlorine atoms combine to form a molecule, energy is

- 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

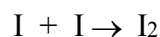
3. Given the reaction:



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  $\text{NaX}$  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)  $\text{CO}$
- B)  $\text{KF}$
- C)  $\text{CaO}$
- D)  $\text{LiH}$

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

- A)  $\text{CO}_2$
- B)  $\text{NH}_3$
- C)  $\text{KBr}$
- D)  $\text{Cl}_2$

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  $\text{Ca}^{2+}$  has

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

## Bonding practice lessons 1-3

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)  $\text{CaCO}_3$
- B)  $\text{PCl}_3$
- C)  $\text{MgF}_2$
- D)  $\text{CH}_2\text{O}$

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)  $\text{H}_2\text{O}$
- B)  $\text{Na}_2\text{O}$
- C)  $\text{CaO}$
- D)  $\text{MgO}$

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, $801^{\circ}\text{C}$	Low, decomposes at $186^{\circ}\text{C}$
Solubility in $\text{H}_2\text{O}$ (grams per 100.0 g $\text{H}_2\text{O}$ at $0^{\circ}\text{C}$ )	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)  $\text{H-Br}$
- B)  $\text{H-Cl}$
- C)  $\text{H-F}$
- D)  $\text{H-I}$

