

Name:

Date:

Hour:

CALVIN

Chemistry ~ Ch.7 and 8 Review Pt. 1

1) Give names for the following:

- a) $Mg(MnO_4)_2$ Magnesium Permanganate
b) $Ca(CO_3)$ Calcium Carbonate
c) $Cu(NO_3)_4$ Copper (II) Nitrate
d) Na_3P Sodium Phosphide
e) CO_2 Carbon dioxide
f) $B_2(SO_3)_3$ Boron Sulfite
g) $CaCl_2$ Calcium Chloride
h) $Ag(NO_3)$ Silver Nitrate
i) $AlCl_3$ Aluminum Chloride
j) $K_2(CO_3)$ Potassium Carbonate

2) Write formulas for:

- a) Iron (IV) Oxide $Fe^{+4} O_2^{-2}$ FeO_2
b) Calcium Cyanide $Ca^{+2} (CN)^{-1}$ $Ca(CN)_2$
c) Strontium Fluoride $Sr^{+2} F^{-1}$ SrF_2
d) Magnesium Nitride $Mg^{+2} N^{-3}$ Mg_3N_2
e) Aluminum Sulfate $Al^{+3} (SO_4)^{-2}$ $Al_2(SO_4)_3$
f) Sodium Phosphate $Na^{+1} (PO_4)^{-3}$ $Na_3(PO_4)$
g) Cobalt (II) Iodide $Co^{+2} I^{-1}$ CoI_2
h) Barium Carbonate $Ba^{+2} (CO_3)^{-2}$ $Ba(CO_3)$
i) Barium Chloride $Ba^{+2} Cl^{-1}$ $BaCl_2$
j) Hydrogen Nitrate $H^{+1} (NO_3)^{-1}$ $H(NO_3)$
k) Potassium Sulfide $K^{+1} S^{-2}$ K_2S
l) Lithium Sulfide $Li^{+1} S^{-2}$ Li_2S

3) Give Name, Symbol, and Charge for:

- a) Nitrate NO_3^{-1}
b) Nitrite NO_2^{-1}
c) Nitride N^{-3}

4) Give Name, Symbol, and Charge for:

- a) Sulfide S^{-2}
b) Sulfite SO_3^{-2}
c) Sulfate SO_4^{-2}

5) Bromine gains 1 electrons to achieve noble gas status.

6) Bromine would have a -1 charge.

7) List three elements with a -2 charge and ONE element with a +2 charge

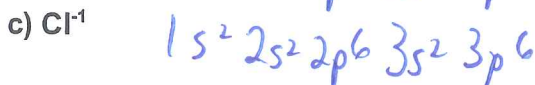
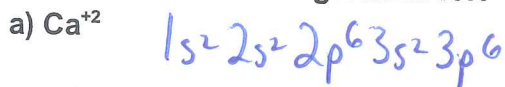
-2
Reasonable

+2
Reasonable

8) Give the formula (symbol and charge) for the ion formed by Bismuth.



9) What is the electron configuration for:



10) List two elements that might form an ionic compound and two that might form a covalent compound:

Ionic

Covalent

Reasonable

11) Use Lewis dot diagrams and a sentence or two to fully explain HOW:

a) a covalent bond forms between two Fluorine atoms



Share electrons to reach an octet

b) an ionic bond forms between Sodium and Chlorine



Cl steals electron making Cl^{-1} and Na^{+1} , opposites attract

12) How many valence electrons and what is the charge for:

| | <u>Element</u> | <u>Valence</u> | <u>Charge</u> |
|----|----------------|----------------|---------------|
| a) | Boron | <u>3</u> | <u>+3</u> |
| b) | Calcium | <u>2</u> | <u>+2</u> |
| c) | Bromide | <u>7</u> | <u>-1</u> |
| d) | Argon | <u>8</u> | <u>0</u> |

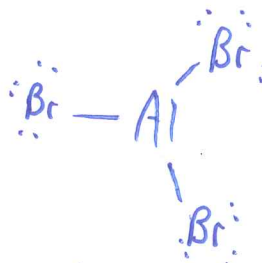
13) Draw a Lewis structure for EACH geometry (all 5). Include lewis structure, geometry, hybridization, and # of sigma/pi bonds.



linear, sp , 2 sigma / 2 pi



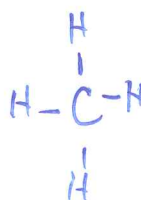
bent, sp , 2 sigma



trig. planar, sp^2 , 3 sigma



trig. pyramidal, sp^3 , 3 sigma



tetrahedral, sp^3 , 4 sigma

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Name:

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Ch.7/8 Review Pt.2

5

1. How many valence electrons are in an atom of phosphorus?

2

2. How many valence electrons are in an atom of magnesium?

Valence

3. What is the name given to the electrons in the highest occupied energy level of an atom?

1s²2s²2p⁶3s²3p⁶

4. What is the electron configuration of the calcium ion?

2

5. How many electrons does barium have to give up to achieve a noble-gas electron configuration?

A.

6. Which of the following elements does NOT form an ion with a charge of 1?

- a. fluorine b. hydrogen c. potassium d. sodium

gains 2

7. How does oxygen obey the octet rule when reacting to form compounds?

C.

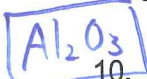
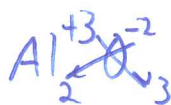
8. What is the net charge of the ionic compound calcium fluoride?

- a. 2- b. 1- c. 0 d. 1+

D.

9. Which of the following is true about an ionic compound?

- a. it is a salt b. it is held together by ionic bonds
c. it is composed of anions and cations d. all of the above



10. What is the formula unit of aluminum oxide?



11. What is the formula for potassium sulfide?

Solid

12. Ionic compounds are normally in which physical state at room temperature?

electrons

13. Which particles are free to drift in metals?

A.

14. An ionic bond is a bond between ____.

- a. a cation and an anion b. valence electrons and cations
c. the ions of two different metals d. the ions of two different non metals

15. Give characteristics of ionic compounds and covalent compounds:

Reasonable

D. 16. Which of the following elements can form diatomic molecules held together by triple covalent bonds?

- a. Carbon b. Oxygen c. Fluorine d. Nitrogen

C. 17. Which of the following diatomic molecules is joined by a double covalent bond?

- a. H₂ b. N₂ c. O₂ d. F₂

A. 18. According to VSEPR theory, molecules adjust their shapes to keep which of the following as far apart as possible?

- a. pairs of valence electrons b. mobile electrons
c. inner shell electrons d. the electrons closest to the nuclei

tetrahedral 19. The shape of the methane molecule is called ____.

unshared pairs of electrons repelling 20. What causes water molecules to have a bent shape, according to VSEPR theory?

sp³ 21. What type of hybrid orbital exists in the methane molecule?

C. 22. A bond formed between a silicon atom and an oxygen atom is likely to be ____.

- a. ionic b. coordinate covalent
c. polar covalent d. nonpolar covalent

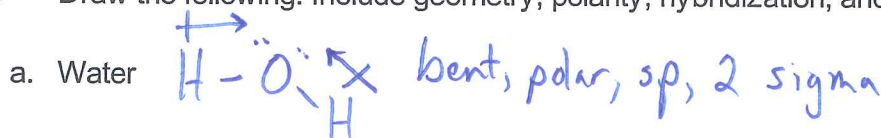
A. 23. Which of the following covalent bonds is the most polar?

- a. H—F b. H—H c. H—C d. H—N

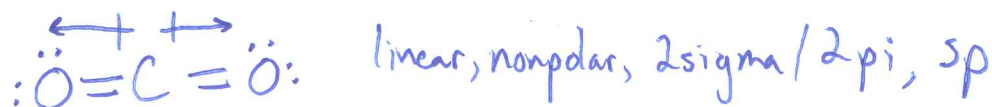
B. 24. What causes dipole interactions?

- a. sharing of electron pairs b. attraction between polar molecules
c. bonding of a covalently bonded hydrogen to an unshared electron pair
d. attraction between ions

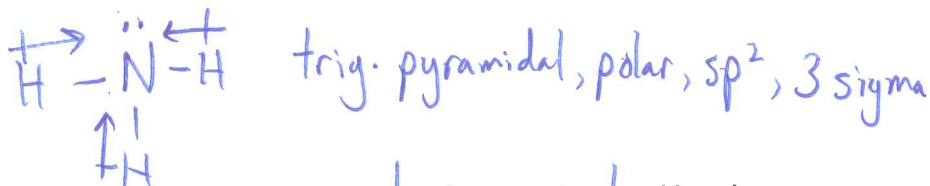
____ 25. Draw the following. Include geometry, polarity, hybridization, and # of sigma/pi bonds:



c. Carbon dioxide



d. Ammonia (NH₃)



___ 26. A double bond consists of ___ 1 ___ sigma and ___ 1 ___ pi bonds.

B. 27. Ionic and covalent bonds are _____ forces.
a. intermolecular b. intramolecular

B. 28. Multiple Lewis structure possibilities are called:
a. renaissance b. resonance c. residence d. residents

covalent 29. _____ bonds are formed by two nonmetals.

ionic 30. _____ bonds are formed by a metal and nonmetal

-3 31. An atom that has gained three electrons will have a charge of:

+2 32. An atom that has lost two electrons will have a charge of:

negative 33. Nonmetals tend to form _____ ions.

positive 34. Metals tend to form _____ ions

shell 35. What does the "S" stand for in VSEPR

7 36. A) There are _____ diatomic molecules:
B) List them:

A. 37. _____ forces are responsible for holding the H to the O in water.
a. Intramolecular b. Intermolecular

B. 38. Forces responsible for holding water molecules together in an ice cube.
a. Intramolecular b. Intermolecular

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Resonance structures

