Key

Unit 2 Test Review: Bonding, & Nomenclature

- Matter

- Physical and Chemical Properties and Changes

1. Determine if the following are physical properties/changes or chemical properties/changes.
   a. Melting point P
   b. Ability of rust C
   c. Density P
   d. Transparency P
   e. Glass breaking P
   f. A rusting bicycle C
   g. Frying an egg C
   h. Squeezing oranges for juice P
   i. Mixing salt and water P
   j. Cutting the grass P
   k. Fireworks exploding C
   l. Boiling water P

- Kinetic Molecular Theory and States of Matter

2. What are the 4 states of matter and how are they different from each other in terms of…

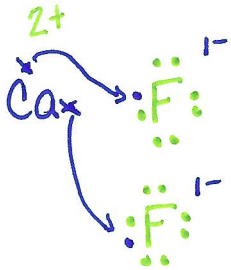
	solids	liquids	gases	plasmas
a. Particles	very close together	close together	far apart	very far apart
b. Movement	vibrate	flow past each other	randomly	randomly
c. Speed of particles	slow ←		→	very fast
d. Kinetic energy	low ←		→	high

Bonding

3. Ionic Bonds
   e. Occurs between metals & nonmetals
   f. When electrons (e^-) are taken or stolen
   g. Ionic compound properties
      1. high melting & boiling points
      2. hard, crystalline solids
      3. conduct electricity when molten or dissolved in water

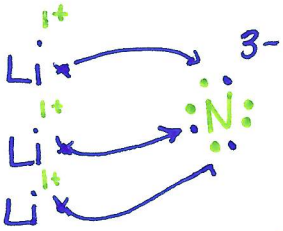
h. Electron Dot Diagrams

1. Ca & F



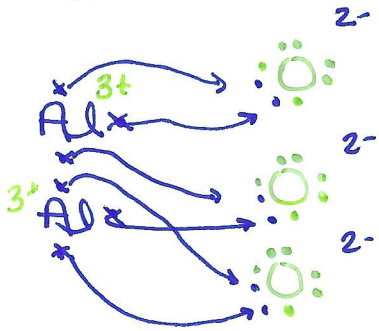
CaF_2

2. Li & N



Li_3N

3. Al & O



Al_2O_3

4. Covalent Bonds

a. Occurs between a nonmetal & a nonmetal

b. When electrons (e^-) are shared

c. Covalent Compound Properties

1. low melting & boiling points
2. solids, liquids, or gas at room temperature
3. insulators (non-conductors)

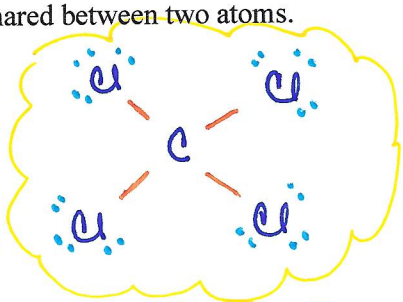
5. Lewis Structures: Show how valence e⁻ are shared between two atoms.

a. CCl_4

$1(4e^-) + 4(7e^-)$

$4e^- + 28e^- = \frac{32e^-}{2}$

16 prs
-4
12 lone pairs



b. H_2S

$2(1e^-) + 1(6e^-)$

$2e^- + 6e^-$

$= 8e^-/2$

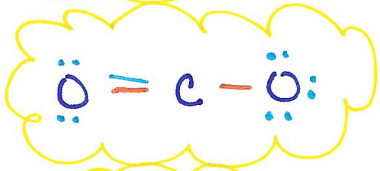
4 prs.
-2
2 lone pairs

c. CO_2

$1(4e^-) + 2(6e^-)$

$4e^- + 12e^- = \frac{16e^-}{2}$

8 prs.
-2
2 lone pairs

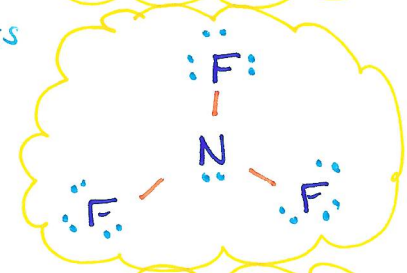


d. NF_3

$1(5e^-) + 3(7e^-)$

$5e^- + 21e^- = \frac{26e^-}{2}$

13 prs
-3
10 lone pairs

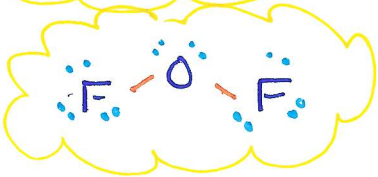


e. OF_2

$1(6e^-) + 2(7e^-)$

$6e^- + 14e^- = \frac{20e^-}{2}$

10 prs
-2
8 lone pairs

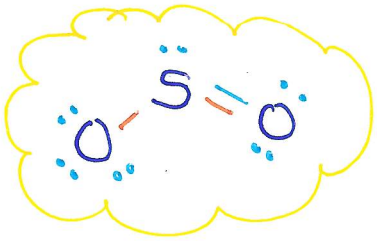


f. SO_2

$1(6e^-) + 2(6e^-)$

$6e^- + 12e^- = \frac{18e^-}{2}$

9 prs
-2
7 lone pairs



6. Use the periodic table with electronegativities on it to determine if the following bonds are ionic (greater than 1.8), polar covalent (between .4 and 1.8), or pure covalent (less than .4).

a. H – C

C 2.5
H −2.1
.4
pure covalent

b. Al – O

O 3.5
Al −1.5
2.0
ionic

d. O - F

F 4.0
O −3.5
.5
polar covalent

e. Ge - S

S 2.5
Ge −1.8
.7
polar covalent

c. N – P N 3.0 − P 2.1 = .9 polar covalent

Nomenclature

How do you know what type of compound it is?

Type I Binary Regular metal + nonmetal Criss-cross charges	**Type II Binary** Transition metal + nonmetal Name has Roman Numerals Criss-cross charges	**Type III** 2 nonmetals Name uses prefixes	**Binary Acid** Hydrogen + anion NO Oxygen Name has hydro------ic acid Criss-cross charges
Type I Tertiary Regular metal + polyatomic ion Criss-cross charges	**Type II Tertiary** Transition metal + polyatomic ion Name has Roman Numerals Criss-cross charges		**Oxyacid** Hydrogen + polyatomic ion with Oxygen Name is ------ic acid or ------ous acid Criss-cross charges

7. NOMENCLATURE - MIXED REVIEW

1. carbon tetrachloride CCl4
2. mercury(II) oxide HgO
3. potassium chlorate KClO3
4. hydrobromic acid HBr
5. sodium hydroxide NaOH
6. copper(I) dichromate Cu2Cr2O7
7. boron trifluoride BF3
8. phosphorous acid H3PO4
9. aluminum sulfate Al2(SO4)3
10. copper(II) nitrate Cu(NO3)2
11. sodium phosphate Na3PO4
12. mercury(II) nitrate Hg(NO3)2
13. aluminum hydroxide Al(OH)3
14. sulfuric acid H2SO4
15. lead (II) carbonate PbCO3
16. sodium chromate NaCrO4

26. $CaCO_3$ calcium carbonate
27. Li_2S lithium sulfide
28. HI hydroiodic acid
29. $Tl(NO_3)_3$ thallium (III) nitrate
30. NH_4NO_3 ammonium nitrate
31. $Cu(ClO_4)_2$ copper (II) perchlorate
32. H_3PO_4 phosphoric acid
33. S_2O_5 disulfur pentoxide
34. $Rb_2Cr_2O_7$ rubidium dichromate
35. KMnO4 potassium permanganate
36. $Cu(NO_3)_2$ copper (II) nitrate
37. $Ni(OH)_2$ nickel (II) hydroxide
38. $XeCl_2$ xenon dichloride
39. $(NH_4)_2SO_4$ ammonium sulfate
40. $PbCl_2$ lead (II) chloride
41. HCN hydrocyanic acid

17. silicon dioxide SiO_2

18. barium chloride $BaCl_2$

19. nickel(II) phosphate $Ni_3(PO_4)_2$

20. copper(I) acetate $CuC_2H_3O_2$

21. chlorous acid $HClO_2$

22. iodine pentafluoride IF_5

23. tin(IV) sulfate $Sn(SO_4)_2$

24. chromium(II) oxide CrO

25. lithium iodide LiI

42. $Fe_3(PO_4)_2$ iron (II) phosphate

43. $AgNO_3$ silver (I) nitrate

44. $HClO_3$ chloric acid

45. N_2O_5 dintrogen pentoxide

46. $AlCl_3$ aluminum chloride

47. $TiCl_4$ titanium (IV) chloride

48. $Cr_2(SO_3)_3$ chromium (III) sulfite

49. KOH potassium hydroxide

50. CBr_4 carbon tetrabromide