QUIZ 4 (WORKSHEET + SUMMARIES)

A)

$$\% \xleftarrow{\times 10^{-4}, \text{ move 4 DECML places, right}}_{\times 10^4, \text{ move 4 DECML places, left}} \text{ppm}$$

a. $.0385 \%$ → _____ ppm

b. 2.9 ppm → _____ %

c. 47000 ppm → _____ %

d. $.94 \%$ → _____ ppm

e. 5 ppm → _____ %

f,g,h... end of Lecture Notes # 11, F, sep 28

MAIN GASES in AIR:

(____ %) is _____

(____ %) is _____

(____ %) is _____

OTHER OTHER and

Rn is 10^{-15} ppm (?)

$2 H_2O_2 \xrightarrow{KI} 2 H_2O(l) + O_2(g)$

hydrogen carbonate, $\underline{HCO_3^-}$, is a whole unit (don't split it!)

although "$\underline{HCO_3^-} \rightarrow H^+ + CO_3^{2-}$" is possible

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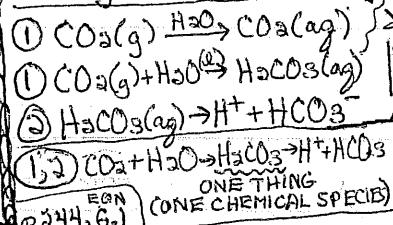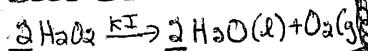
hydrogen chloride, HCl(g)
hydrochloric acid, HCl(aq)

$HCl(g) \xrightarrow{H_2O} HCl(g)$

① $CO_2(g) \xrightarrow{H_2O} CO_2(aq)$

① $CO_2(g) + H_2O(l) \rightarrow H_2CO_3(aq)$

② $H_2CO_3(aq) \rightarrow H^+ + HCO_3^-$

(1,2) $CO_2 + H_2O \rightarrow H_2CO_3 \rightarrow H^+ + HCO_3$

p 344, EQN 6.1 ONE THING (ONE CHEMICAL SPECIE)
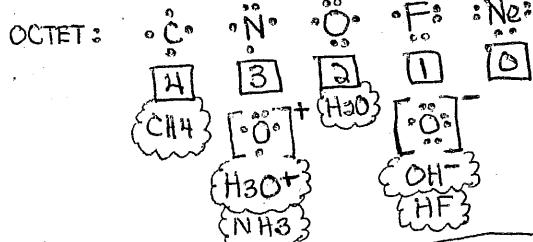
maybe: for neutral speci, specify (g),(l),(s),(aq)

for ionic, not necessary (assume aq)
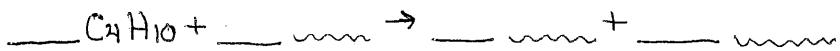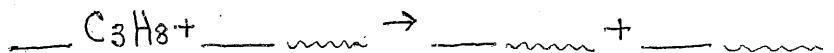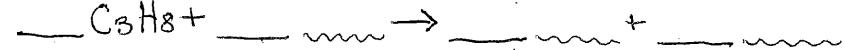
B) (BURNING, OXIDATION)

COMPLETE COMBUSTION (what are products?)
(RXN with OXYGEN)

___ $C_3H_8 +$ ___ ~~~~ → ___ ~~~~ + ___ ~~~~

___ $C_4H_{10} +$ ___ ~~~~ → ___ ~~~~ + ___ ~~~~
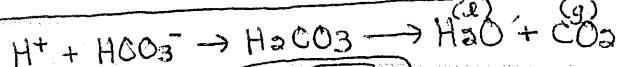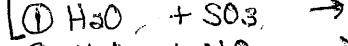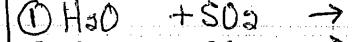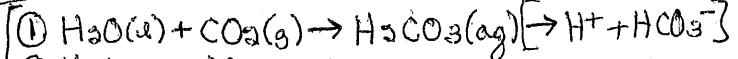
INCOMPLETE COMBUSTION (what are products?)

___ $C_3H_8 +$ ___ ~~~~ → ___ ~~~~ + ___ ~~~~

C_4H_{10} ___ →

O_2 supports combustion, i.e. the burning of FUEL.

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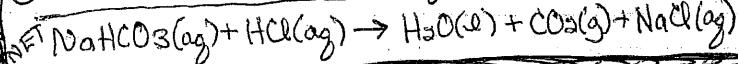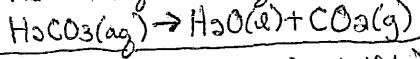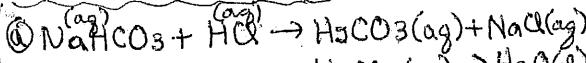
here, H_2O is not a reactant, is over the arrow

here, H_2O is a reactant, is not over the arrow

① $H_2O(l) + CO_2(g) \rightarrow H_2CO_3(aq) [\rightarrow H^+ + HCO_3^-]$

① $H_2O + SO_2 \rightarrow$

① $H_2O + SO_3 \rightarrow$

NO_2 ① $H_2O + NO_2 \rightarrow$

$H^+ + HCO_3^- \rightarrow H_2CO_3 \rightarrow H_2O^{(l)} + CO_2^{(g)}$

(H H/C O O) "LASSOO" CHEMISTRY

ⓐ $NaHCO_3 + HCl^{(aq)} \rightarrow H_2CO_3(aq) + NaCl(aq)$

ⓑ $H_2CO_3(aq) \rightarrow H_2O(l) + CO_2(g)$

NET $NaHCO_3(aq) + HCl(aq) \rightarrow H_2O(l) + CO_2(g) + NaCl(aq)$
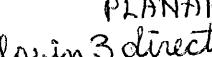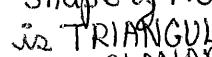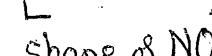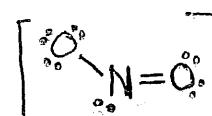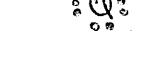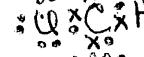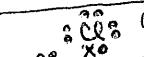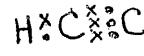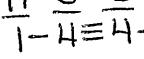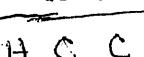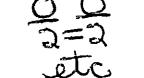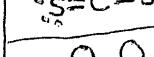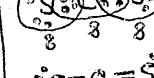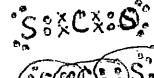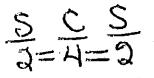
A) 385 ppm, $.00029\%$, 4.7%, 9400 ppm, $.0005$ ppm

B) $(1,5,3,4)$, $(1,6.5,4,5)$ or $(2,13,8,10)$ 13/2

INCOMPLETE $(1,3.5,3,4)$ and $(1,4.5,4,5)$
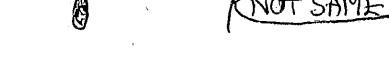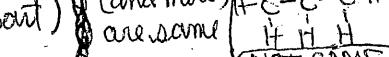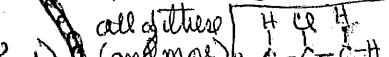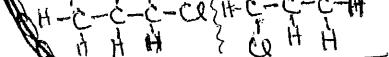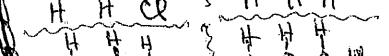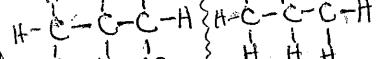
PRINCIPLES for ~~~~ (Oct-Nov-Dec)

• electrons (negative) REPEL electrons (NEG); unshared (non-bonding) electron-pairs get as far apart as possible; count the # of directions you see el-pairs:

2 dims (linear), 3 (triangular planar), 4 (tetrahedral)

DUET: •H

OCTET: :C• :N• :O• :F• :Ne:

[H] [3] [2] [1] [0]

[H] CH4

[:O:]⁻ [:O:]⁻ H3O OH⁻/HF

H3O⁺ NH3

OH⁻/HF

DRAW: CH4 ～ NH3 ～ H2O ～ HF

C2H6   CF4   H3O⁺

C2H4   CCl4   Na ～ (O2) ～ F2

(C2H2)   (CHCl3)   (NO2⁻)

(CO2)

(CS2)

$\dfrac{S \quad C \quad S}{2=4=2}$

:S:×C:×:S:

:S:×C:×:S: 8 8 8

:S=C=S:

$\dfrac{O \quad O}{2=2}$ etc

$\underline{H \quad \underline{C} \quad \underline{C} \quad H}$
$1-4 \equiv 4-1$

H×C×:×C×H

:Cl:
:Cl:×C×H   CHCl3
:Cl:

[:O: / •N=O:]⁻

Shape of NO_2^- is **TRIANGULAR PLANAR**

(els in 3 directions, get maxmly far apart)

CONNECTIVITY counts!

(connectivity structure diagrams of hydrocarbons and chlorinated compounds)

all of these (and more) are same

H C H
H-C-C-C-H ... NOT SAME
H H H