ionic - metal/nonmetal

covalent - nonmetal/nonmetal

Sodium sulfate

$SiCl_4$

Fe^{+3} S^{-2}

Fe^{+3} S^{-2}

S^{-2}

Fe_2S_3

S^{-2} Sulfide

SO_4^{-2} Sulfate

$1 \text{ mole} = 6.02 \times 10^{23} \text{ particles}$

NaCl 6.02×10^{23} particles

$23 \times 1 = 23$

$35 \times 1 = 35$

$58 \text{ g} = 1 \text{ mol}$

KCl

$39 \times 1 = 39$

$35 \times 1 = 35$

$74\,g = 1\,mol$

H_2O 6.02×10^{23} molec.

$1 \times 2 = 2$

$16 \times 1 = 16$

$18\,g = 1\,mol$

Ni

$59g = 1mol = 6.02 \times 10^{23}$ atoms

$CaCl_2$

$40 \times 1 = 40$

$35 \times 2 = 70$

$110\ g = 1\ mol$

$$\frac{84.5\ g \times \frac{1\ mol}{110\ g}}{} = 0.768\ mol$$

$KMnO_4$

$39 \times 1 = 39$

$55 \times 1 = 55$

$16 \times 4 = 64$

$158\,g = 1\,mol$

$$\frac{0.0054\,mol \times 158\,g}{1\,mol} =$$

$0.8532\,g$

$0.85\,g$

$Ba(NO_3)_2$

$137 \times 1 = 137$

$14 \times 2 = 28$

$16 \times 6 = 96$

$261\ g = 1\ mol$

$$\frac{35\ g \times 1\ mol}{261\ g} = .134\ mol$$

$.13\ mol$

$58\,g = 1\,mol$

2300000

$2.3 \times 10^{6}\,g \times \frac{1\,mol}{58\,g} = 39,655\,mol$

$4.0 \times 10^{4}\,mol$

$40,000\,mol$

$Ba(NO_3)_2 + 2NaCl \rightleftharpoons BaCl_2 + 2NaNO_3$

reactant product

Coefficents can be change. Coefficient are out in front. They represent the # of moles you have.

Always balance the polyatomic ions first.

$$16\,Fe + 3\,S_8 \xrightarrow{=} 8\,Fe_2S_3$$

Synthesis Rxn

$88 \times 3 = 264$

$31 \times 2 = 62$

$16 \times 8 = 128$

$454\,g = 1\,mol$

$Sr_3(PO_4)_2$

$$\frac{350\,g \times 1\,mol}{454\,g} \therefore .7709\,mol$$

$.77\,mol$

$Ca(C_2H_3O_2)_2$

$40 \times 1 = 40$

$12 \times 4 = 48$

$1 \times 6 = 6$

$16 \times 4 = 64$

$$Al_2(SO_4)_3 + 3Ca(OH)_2 \rightarrow$$

$$2Al(OH)_3 + 3CaSO_4$$

Double Replacement Rxn

$2NaN_3 \longrightarrow 3N_2 + 2Na$

decomposition rxn

$8 + 6 = 14$

$2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$

(2) (7)

$+\frac{4}{3}$

Combustion rxn

Of a hydrocarbon

1. Balance the Cs
2. Balance the Hs
3. Balance the Os

If you cannot balance the Os add 2 in front of the hydrocarbon. Go back to step 1.

$$2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$$

8

6

14

$Al(OH)_3$

(s) (aq)

(ℓ)

(g)

$$2S + 3O_2 \rightarrow 2SO_3$$

$$C_2H_4 + 3O_2 \rightarrow$$

$$2CO_2 + 2H_2O$$

$$\begin{array}{r} 4 \\ +\ 2 \\ \hline 6 \end{array}$$

$$N_2 + O_2 \longrightarrow 2NO$$

$$C_3H_8 + 5O_2 \rightarrow$$

$$3CO_2 + 4H_2O$$

$$6 + 4 = 10$$

5.5 c.

$$4Fe + 3O_2 \rightarrow 2Fe_2O_3$$

5.7 b.

$2Al + 3CuSO_4 \rightarrow 3Cu + Al_2(SO_4)_3$

Single replacement

5.7 c.

$Pb(NO_3)_2 + 2NaCl \longrightarrow$

$PbCl_2 + 2NaNO_3$

Double Rep.

$$NaClO_3 + Fe \rightarrow$$

$$FeO + NaCl + O_2$$

$$CaC_2 + H_2O \rightarrow$$

$$CaO + C_2H_2$$

$$2NaHCO_3 \rightarrow$$

$$Na_2CO_3 + CO_2 + H_2O$$

$$\begin{array}{r} 3 \\ 2 \\ 1 \\ \hline 6 \end{array}$$

$$4Al + 3O_2 \rightarrow 2Al_2O_3$$

$$2NaOH + H_2SO_4 \longrightarrow$$

$$Na_2(SO_4) + 2HOH$$

$$2Fe_2O_3 + 3C \rightarrow 3CO_2 + 4Fe$$

Single Repacement

$$3\overset{4.8}{C_5C_2H_3O_2} + AlPO_4 \rightarrow$$

$$\overset{?}{Al(C_2H_3O_2)_3} + C_3PO_4$$

$$\frac{4.8}{3} = \frac{x}{1} \qquad (4.8) = \frac{3x}{3}$$

$$x = 1.6\,mol$$

$$\underset{x}{CH_4} + \underset{2}{2O_2} \rightarrow \underset{1}{CO_2} + 2H_2O \qquad \underset{7.84}{}$$

$$\frac{345g \times 1mol}{44g} = 7.84mol$$

$$\frac{x}{2} = \frac{7.84}{1} \quad x = 15.68mol$$

x 5.0

$$2H_2 + O_2 \rightarrow 2H_2O$$

$$\frac{x}{2} = \frac{5}{1}$$

$x = 2(5)$

$x = 10$

$x = 10\ mol$

$x = 10.\ mol$

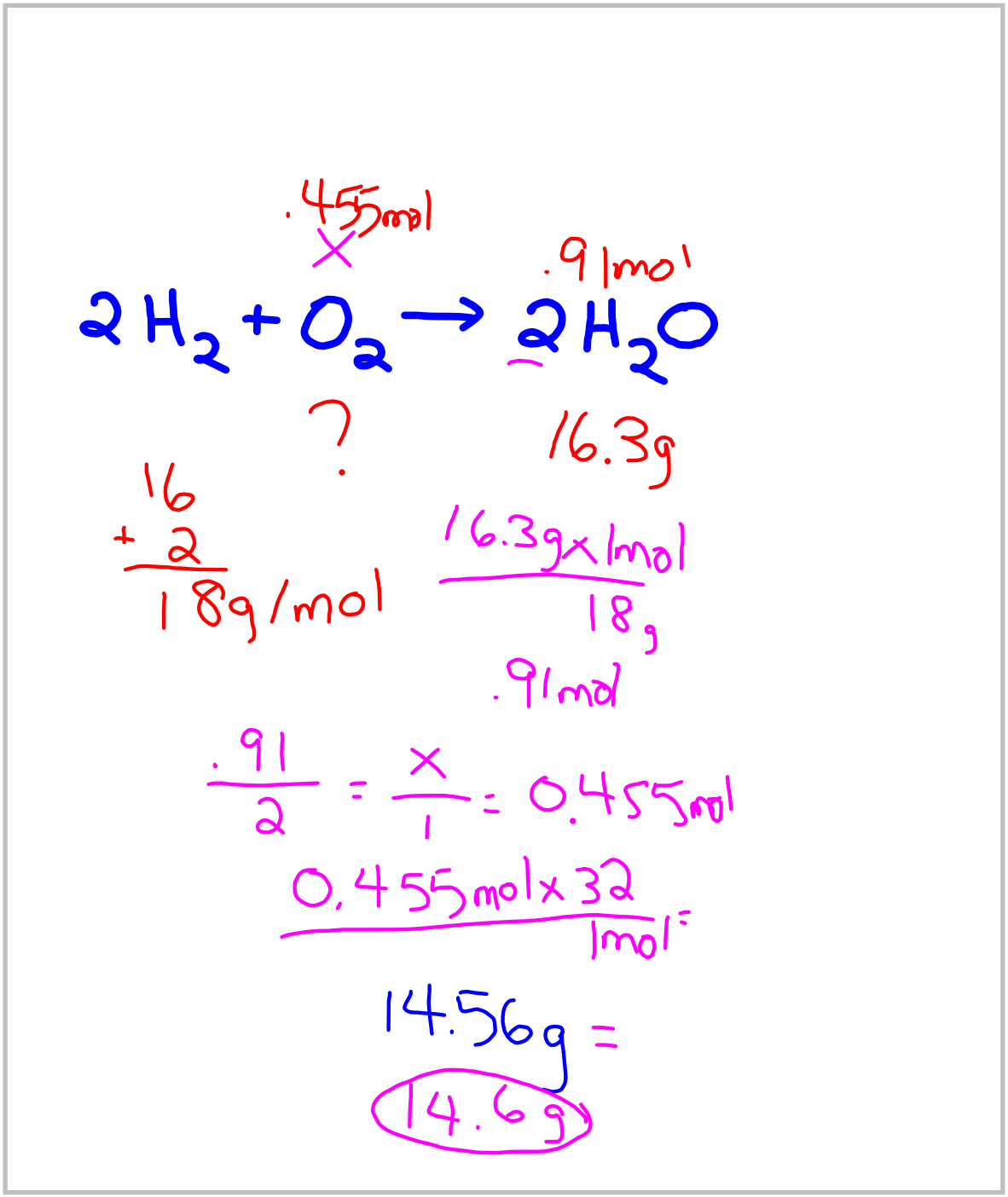
$1.0 \times 10^1\ mol$

1.5 ?

3 eggs + 2 cup water + 1 package

→ 1 cake

$\frac{1.5}{3} = \frac{x}{1}$ $\frac{3x}{3} = \frac{1.5}{3}$ $x = 1.5$


.455mol
.91mol
2H2 + O2 → 2H2O
?
16.3g
16
+ 2
18g/mol
16.3g x 1mol / 18g
.91mol
.91/2 = x/1 = 0.455mol
0.455mol x 32 / 1mol =
14.56g =
14.6g

$$5C + 2SO_2 \rightarrow CS_2 + 4CO$$

10

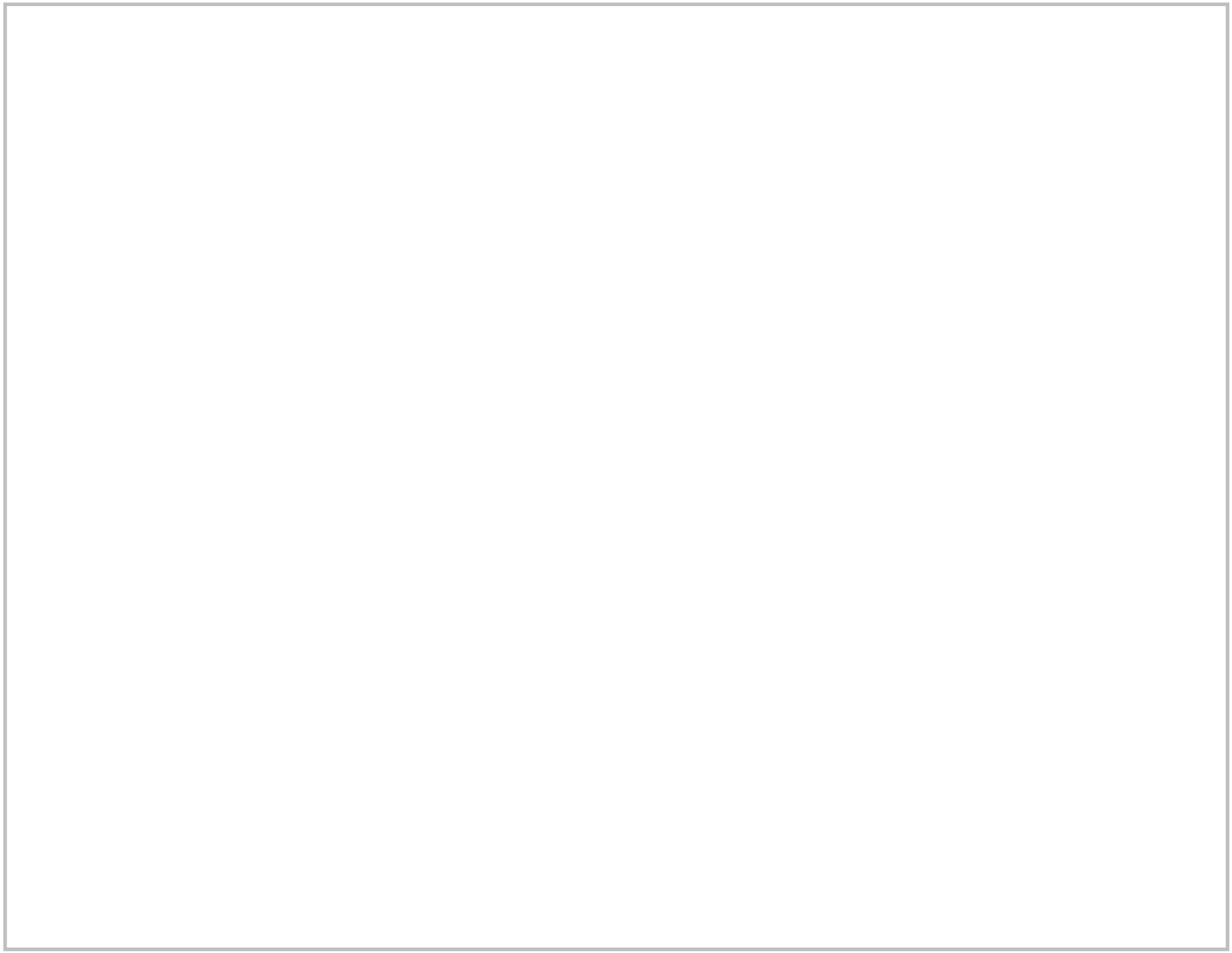
$C_3H_8 + 5O_2 \rightarrow$

$3CO_2 + 4H_2O$

6

+ 4

10



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.83 x

$$\_\,CH_4 + \_2O_2 \rightarrow CO_2 + 2H_2O$$

$$\frac{.83}{1} \rightleftharpoons \frac{x}{2}$$

$(.83)(2) = 1.66$

1.7 mol

O_2 16×2

0.228125

$$CH_4 + 2O_2 \rightarrow \overset{x}{C}O_2 + 2H_2O$$

$7.3g$ $?g$

$$\frac{7.3\,g \times 1\,mol}{32\,g} = 0.228125$$

$$\frac{0.228125}{2} = \frac{x}{1}$$

$$\frac{0.228125}{2} = \frac{x2}{2}$$

0.1140625

$12 \times 1 = 12$

$16 \times 2 = 32$

$44\,g = 1\,mol$

$$\frac{0.1140625\,mol \times 44\,g}{1\,mol} =$$

$5.01875\,g$

$5.0\,g$

$$4Fe + 3O_2 \rightarrow \overset{0.0125}{2Fe_2O_3}$$

? 2g

Fe $56 \times 2 = 112$

O $16 \times 3 = \underline{48}$

$160g = 1mol$

$\frac{2g \times 1mol}{160g} = 0.0125$

$\frac{0.0125}{2} = \frac{x}{4}$

$\frac{(0.0125)(4)}{2} = \frac{2x}{2}$

0.025 mol Fe

$0.025\ mol \times \frac{56g}{1mol} =$

Fe $56g = 1mol$

$1.4g \Rightarrow 1g$

$$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2$$

x (over HCl) ; 850 (over $CaCl_2$) ; ?g (under HCl)

$$\frac{850}{1} \times \frac{x}{2}$$

$850(2) = x \quad x = 1700\ mol\ HCl$

$$\frac{1700\ mol \times 36}{1\ mol} = 61200\ g$$

61000 g of HCl

$$6\,NaNO_3 + CrCl_6 \longrightarrow 6NaCl + Cr(NO_3)_6$$

ionic

covalent

$NaNO_3$

$Cr(NO_3)_6$

23
14
48
85 g = 1 mol

52
84
288
424 g = 1 mol

Na^+ NO_3^-

protons, neutrons, e's
charges
electron configuration
bonds (type)
balancing
naming rxns
naming cmpds
writing formulas
average atomic mass
Periodic table names
of families.