Mole Ratio Notes

- Transferring from mol of sub A to mol sub B

* Balanced rxns tell you how many moles of each sub. there are

$$\underline{1}\ N_2 + \underline{3}\ H_2 \longrightarrow \underline{2}\ NH_3$$

$$\underline{1}\ mol\ N_2 + \underline{3}\ mol\ H_2 \longrightarrow \underline{2}\ mol\ NH_3$$

* These #'s can now be used as ratios or conversion factors to move from 1 sub. to another

- Writing Ratios (separate)
  - $N_2/H_2 = 1/3$ or $1:3$
  - can also be written = top/bottom $\frac{1\ mol\ N_2}{3\ mol\ H_2}$
  - $N_2/NH_3 = 1/2$ or $1:2$ or $\frac{1\ mol\ N_2}{2\ mol\ NH_3}$

- Converting w/ Ratios
  - Start w/ given # over 1
  - Then use mol ratios to convert

$1N_2 + 3H_2 \rightarrow 2NH_3$

- $2.78\ mol\ NH_3 \rightarrow ?\ mol\ N_2$

$$\frac{2.78\ mol\ NH_3}{1} \times \frac{1\ mol\ N_2}{2\ mol\ NH_3} = 1.39\ mol\ N_2$$

$$\frac{2.78}{2} = 1.39$$

- $2NaCl \rightarrow 2Na + 1Cl_2$

- how many mol Cl_2 can be Formed From 2.7 g NaCl? B

NaCl

Na	22.990 x 1
Cl	35.453 x 1
	58.443 g

$$\frac{2.7\ g\ NaCl}{1} \times \frac{1\ mol\ NaCl}{58.443\ g\ NaCl} \times \frac{1\ mol\ Cl_2}{2\ mol\ NaCl} = .023\ mol\ Cl_2$$

$$\frac{2.7}{58.443 \times 2} =$$

M.M

Coeff.

• $\underline{3}\ CaCl_2 + \underline{2}\ K_3PO_4 \rightarrow \underline{6}\ KCl + \underline{1}\ Ca_3(PO_4)_2$

- how many grams of KCl can be formed from 9.2 g $CaCl_2$?

$$\frac{9.2\ g\ CaCl_2}{1} \times \frac{1\ mol\ CaCl_2}{110.984\ g\ CaCl_2} \times \frac{6\ mol\ KCl}{3\ mol\ CaCl_2} \times \frac{74.551\ g\ KCl}{1\ mol\ KCl} = 12.360\ g\ KCl$$

m.m (110.984 g $CaCl_2$) — coeff. (1 mol $CaCl_2$: 6 mol KCl) — m.m (74.551 g KCl)

$CaCl_2$

Ca	40.078 × 1 = 40.078
Cl	35.453 × 2 = 70.906
	110.984 g

KCl

K	39.098 × 1
Cl	35.453 × 1
	74.551 g

Work

$$\frac{(9.2 \times 6 \times 74.551)}{(110.984 \times 3)} = 12.360\ g\ KCl$$