Liming Reactant

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- Liming Reactant – the reactant that limits the amounts of other reactants that can combine
  - > Determines how much product can be formed
- Excess reactant – the reactant that is not used completely in a reacon

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1. $N_2H_4 + 2H_2O_2 \dashrightarrow N_2 + 4H_2O$

If 0.750 mol of N_2H_4 is mixed with 0.500 mol of H_2O_2

a. What is the liming reactant?

b. How many moles of H_2O are formed?

c. What is the excess reactant and how much is in excess?

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Reactant	Have	Need	Enough?	LR or ER
N_2H_4	0.750mol	0.25mol	Yes	ER
H_2O_2	0.500mol	1.5mol	No	LR

$N_2H_4 + 2H_2O_2 \rightarrow N_2 + 4H_2O$

a) H_2O_2 is LR

b) G: 0.500mol H_2O_2 $\quad 0.500\,\text{mol}\,H_2O_2 \times \frac{4\ \text{mol}\ H_2O}{2\ \text{mol}\ H_2O_2} = 1.0\,\text{mol}\,H_2O$

U: ? mol H_2O

c) N_2H_4 $\quad 0.750\text{mol} - 0.25\text{mol} = 0.50\text{mol}$

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2. If 20.5 g of chlorine is reacted with 20. g of sodium

a. What is the liming reactant?

b. How many grams of product are formed?

c. What is the excess reactant and how much is in excess?

$Cl_2 + 2Na \rightarrow 2NaCl$

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Reactant	Have	Need	Enough?	LR or ER
Cl_2	20.5 g	30.8 g	No	LR
Na	20.0 g	13.3 g	Yes	ER

$Cl_2 + 2Na \rightarrow 2NaCl$

$20.5\,g\,Cl_2 \times \frac{1\,mol\,Cl_2}{70.90\,g\,Cl_2} \times \frac{2\,mol\,Na}{1\,mol\,Cl_2} \times \frac{22.99\,g\,Na}{1\,mol\,Na} = 13.3\,g\,Na$

$20.0\,g\,Na \times \frac{1\,mol\,Na}{22.99\,g\,Na} \times \frac{1\,mol\,Cl_2}{2\,mol\,Na} \times \frac{70.90\,g\,Cl_2}{1\,mol\,Cl_2} = 30.8\,g$

a) Cl_2 is L.R.

b) G: 20.5 g Cl_2

U: ? g NaCl

$20.5\,g\,Cl_2 \times \frac{1\,mol\,Cl_2}{70.90\,g\,Cl_2} \times \frac{2\,mol\,NaCl}{1\,mol\,Cl_2} \times \frac{58.44\,g\,NaCl}{1\,mol\,NaCl} = 33.8\,g\,NaCl$

c) Na is ER 20.0 g − 13.3 g = 6.7 g

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