Gas Stoichiometry – Class

1. H_2 and O_2 are used to make water in the reaction below calculate volume of water in L at STP.

$$2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$$

a. 2 moles H_2 + excess H_2:

$$2\,mol \left| \frac{2\,mol\,H_2O}{2\,mol\,H_2} \right| \frac{22.4L}{1\,mol} = 44.8L$$

b. 2 mole H_2 + 2 moles O_2:

Is still L.R

c. 4g of H_2 + excess oxygen:

$$4g\,H_2 \left| \frac{1\,mol}{2\,g} \right| = 2\,mol \left| \frac{22.4L}{1\,mol} \right| = 44.8L$$

2. Using liters, please calculate the volume of gas produced in the reaction below.

$$2CO(g) + O_2 \rightarrow 2CO_2$$

a. 2L of CO(g) and excess O_2:

$$2L \left| \frac{2\,CO_2}{2\,CO} \right| = 2L\,CO_2$$

b. 2L of CO(g) and 10L O_2:

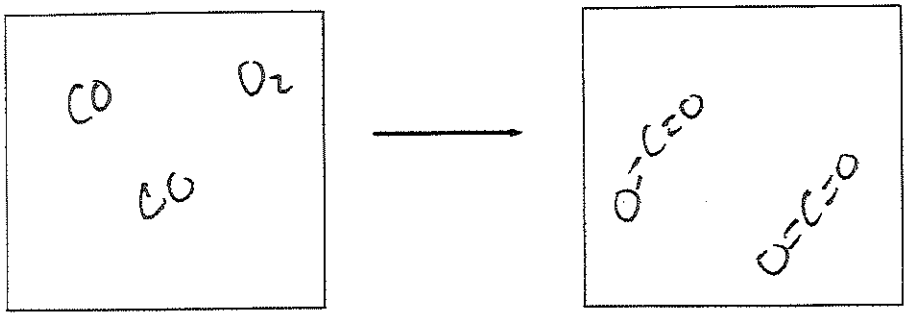
2L CO ← still LR

c. 10L of CO(g) and 2L O_2:

L.R

$$2L\,O_2 \left| \frac{2\,CO_2}{1\,L} \right| = 4L\,O_2$$

Draw 1 cycle of this reaction



Before

After

Gas Stoichiometry – Student

1. H_2 and O_2 are used to make water in the reaction below calculate volume of water in L at STP.

$$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g)$$

a. 2 moles CH_4 + excess O_2:

$$2\,\text{mol}\,CH_4 \left|\frac{2\,H_2O}{1\,\text{mol}\,CH_4}\right. \left|\frac{22.4\,L}{1\,\text{mol}}\right. = 89.6\,L$$

b. 2 mole CH_4 + 2 moles O_2:

LR

$$2\,\text{mol}\,O_2 \left|\frac{2\,H_2O}{2\,O_2}\right. \left|\frac{22.4\,L}{1\,\text{mol}}\right. = 44.8\,L$$

c. 4g of CH_4 + excess oxygen:

Vol. CO_2

$$4g \left|\frac{1\,\text{mol}}{16\,g}\right. = .25\,\text{mol}\,CH_4 \left|\frac{2\,CO_2}{1\,CH_4}\right. \left|\frac{22.4}{1\,\text{mol}}\right. = 11.2\,L$$

2. Using liters, please calculate the volume of gas produced in the reaction below.

$$C_2H_4(g) + 3O_2(g) \rightarrow 2CO_2(g) + 2H_2O(g)$$

(CO_2)

a. 2L of $C_2H_4(g)$ and excess O_2:

$$2L\,C_2H_4 \left|\frac{2\,CO_2}{1}\right. = 4L\,CO_2$$

b. 2L of $C_2H_4(g)$ and 10L O_2:

still LR

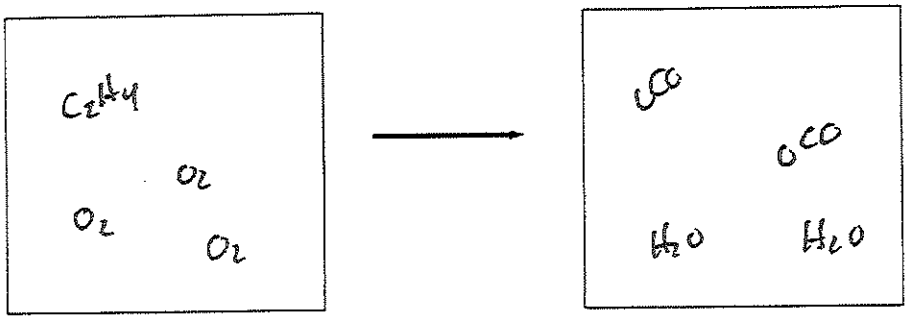
$$2L\,C_2H_4 \left|\frac{2}{1}\right. = 4L\,CO_2$$

c. 10L of $C_2H_4(g)$ and 2L O_2:

LR

$$2L\,O_2 \left|\frac{2}{3}\right. = 1\tfrac{1}{3}\,L\,CO_2$$

Draw 1 cycle of this reaction



Before

After