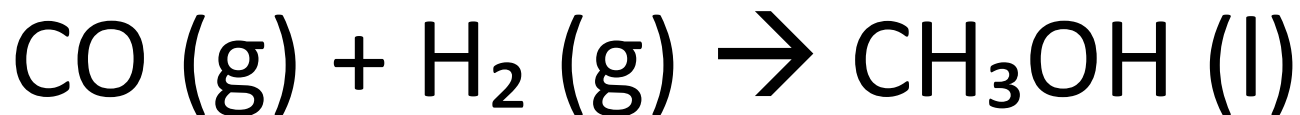


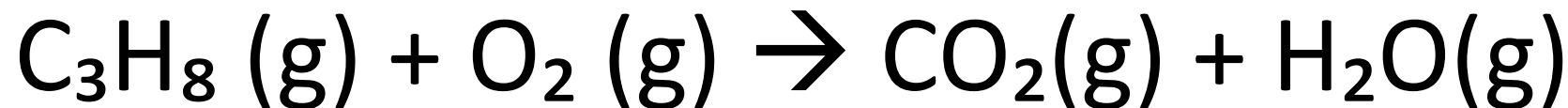
Chapter 9 Chemical Quantities

Information Given By a Chemical Equation

- Recall: chemical changes are really arrangements of atom grouping that can be described by chemical equations.
- **Atoms are just rearranged not created or destroyed**
 - So must always balance an equation!
 - Balanced means the smallest set of integers that gives same # of atoms of each element on both sides



- Balanced:
- Balanced equation gives relative numbers so could multiply by any number & still balanced
- $12\text{CO (G)} + 24\text{H}_2 \rightarrow 12\text{CH}_3\text{OH}$
- 1 dozen CO (g) + 2 dozen H₂ (g) → 1 dozen CH₃OH (l)
- $1 (6.022 \times 10^{23}) \text{ CO (g)} + 2 (6.022 \times 10^{23}) \text{ H}_2 \text{ (g)} \rightarrow 1 (6.022 \times 10^{23}) \text{ CH}_3\text{OH (l)}$
- $(6.022 \times 10^{23}) = 1 \text{ mole (mol)}$



- Balance:
- Meaning 1 molecule C_3H_8 reacts with 5 molecules O_2 to produce 3 molecules CO_2 plus 4 molecules H_2O
- Or moles: 1 mol C_3H_8 reacts with 5 mol O_2 to produce 3 mol s CO_2 plus 4 mol H_2O

9.2 Mole- Mole Relationships

- We can use balanced equation to predict # moles of products produced by given # moles reactants
- $2 \text{H}_2\text{O} (\text{l}) \rightarrow 2\text{H}_2 (\text{g}) + \text{O}_2 (\text{g})$

What if we decompose 4 moles H_2O ?? (multiply everything by 2)

What if we decompose 5.8 moles H_2O
(divide everything by 2 then multiply by 5.8)

Mole Ratios

- 2 mol H₂O = 1 mol O₂ (from coefficients of balanced equations)
- Want to go from moles H₂O to mol O₂

Do together:

- Ex. 9.3-

Do On Your Own

- Pg 243 self check 1,2 AND
- pg 261 # 11-12