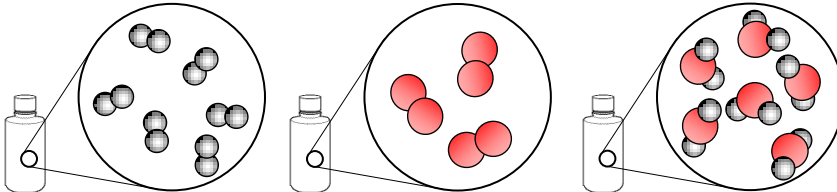


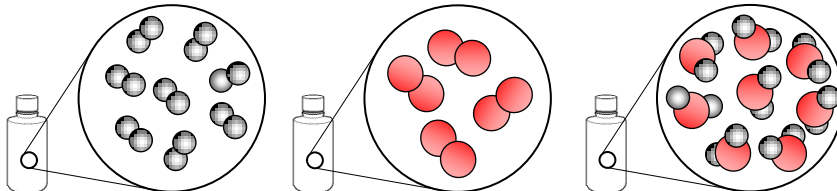
Chemistry: Visualizing the Limiting Reactant

Use the balanced chemical equation $2 \text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2 \text{H}_2\text{O}(\text{g})$ for all the problems on this sheet.

Directions: Assuming that each molecule shown in the first two containers represents one mole of that substance, write the correct number of moles of substance *s* below the containers. Then, assume that the contents of the first two containers are combined in the third container. In the third container, draw the correct number of moles of water produced.

1. 

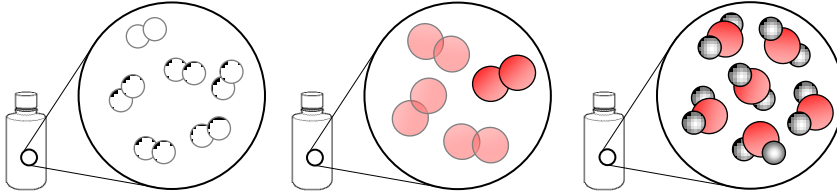
_____ mol $\text{H}_2(\text{g})$ _____ mol $\text{O}_2(\text{g})$ _____ mol $\text{H}_2\text{O}(\text{g})$

2. 

_____ mol $\text{H}_2(\text{g})$ _____ mol $\text{O}_2(\text{g})$ _____ mol $\text{H}_2\text{O}(\text{g})$

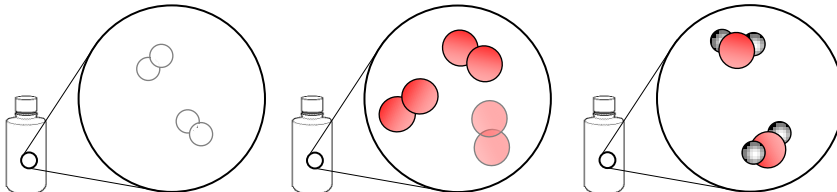
In the questions above, all the H_2 and O_2 reacted. In most reactions, though, the reactants DO NOT combine perfectly; one reactant will be used up before the other; there is too much of one and not enough of the other. The reactant used up first is called the **limiting reactant**, the other(s) is/are called the **excess reactant(s)**.

Directions cont: For each question below, write the number of moles of substances beneath the corresponding containers. In the third container, draw in the correct number of moles of water produced **and** any unreacted, excess reactant that is left over. To the right of each question, write the limiting and excess reactant.

3. 

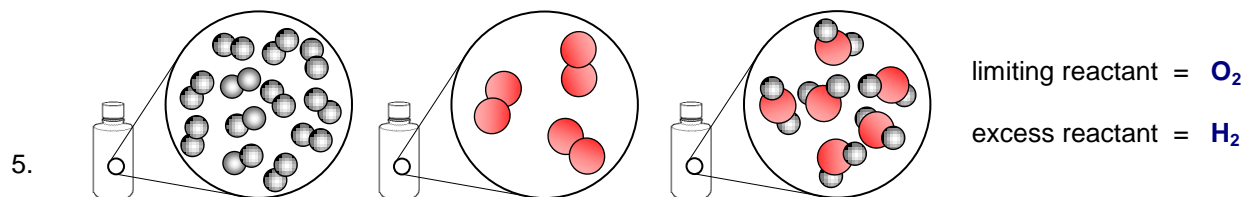
6 mol $\text{H}_2(\text{g})$ 4 mol $\text{O}_2(\text{g})$ 6 mol $\text{H}_2\text{O}(\text{g})$ + 1 mol O_2 left over

limiting reactant = H_2
excess reactant = O_2

4. 

2 mol $\text{H}_2(\text{g})$ 3 mol $\text{O}_2(\text{g})$ 2 mol $\text{H}_2\text{O}(\text{g})$ + 2 mol O_2 left over

limiting reactant = H_2
excess reactant = O_2



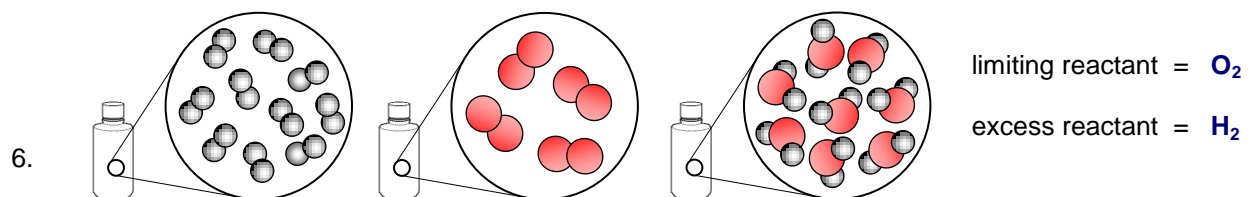
12 mol $\text{H}_2(\text{g})$

3 mol $\text{O}_2(\text{g})$

6 mol $\text{H}_2\text{O}(\text{g})$ + **6** mol H_2 left over

limiting reactant = O_2

excess reactant = H_2



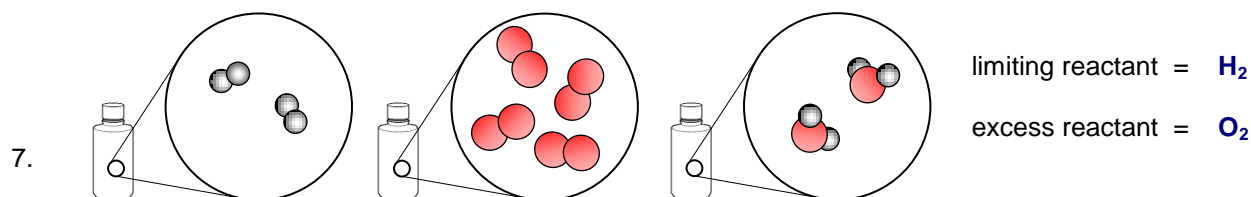
10 mol $\text{H}_2(\text{g})$

4 mol $\text{O}_2(\text{g})$

8 mol $\text{H}_2\text{O}(\text{g})$ + **2** mol H_2 left over

limiting reactant = O_2

excess reactant = H_2



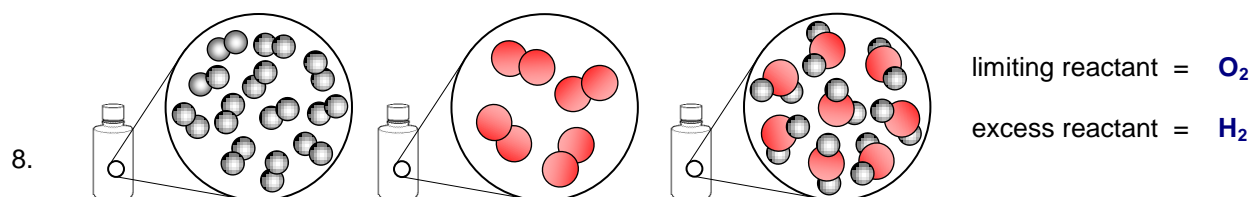
2 mol $\text{H}_2(\text{g})$

4 mol $\text{O}_2(\text{g})$

2 mol $\text{H}_2\text{O}(\text{g})$ + **3** mol O_2 left over

limiting reactant = H_2

excess reactant = O_2



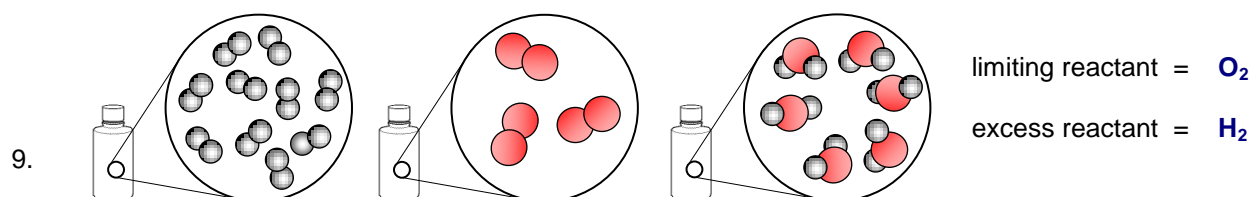
12 mol $\text{H}_2(\text{g})$

4 mol $\text{O}_2(\text{g})$

8 mol $\text{H}_2\text{O}(\text{g})$ + **4** mol H_2 left over

limiting reactant = O_2

excess reactant = H_2



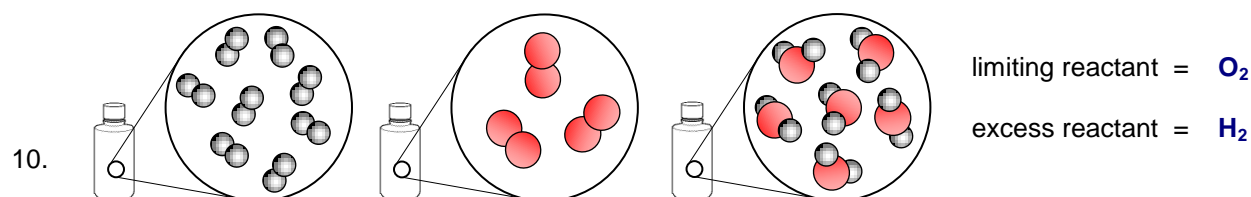
10 mol $\text{H}_2(\text{g})$

3 mol $\text{O}_2(\text{g})$

6 mol $\text{H}_2\text{O}(\text{g})$ + **4** mol H_2 left over

limiting reactant = O_2

excess reactant = H_2



8 mol $\text{H}_2(\text{g})$

3 mol $\text{O}_2(\text{g})$

6 mol $\text{H}_2\text{O}(\text{g})$ + **2** mol H_2 left over

limiting reactant = O_2

excess reactant = H_2