

Discussion Quiz #4

Your Name: \_\_\_\_\_ KEY \_\_\_\_\_

TF's name: \_\_\_\_\_ Discussion /Day/Time: \_\_\_\_\_

Work must be present to receive any credit

1. Consider the reaction:  $2 \text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{l})$

a.) (8 point) If you have 16g of  $\text{H}_2(\text{g})$  ( $MM(\text{H})=1.0\text{g/mol}$ ) and 16g of  $\text{O}_2(\text{g})$  ( $MM(\text{O})=16\text{g/mol}$ ). How many moles of a reactant(s), if any, is (are) leftover assuming reaction precedes 100%?

$\text{O}_2(\text{g})$  limiting reagent

$$16\text{g of } \text{O}_2(\text{g}) \cdot \frac{1\text{mol}}{32\text{g}} = 0.5\text{molO}_2 \cdot \frac{2\text{molH}_2\text{O}}{1\text{molO}_2} = 1\text{molH}_2\text{O}$$

$$16\text{g of } \text{H}_2(\text{g}) \cdot \frac{1\text{molH}_2}{2\text{gH}_2} = 8\text{molH}_2 \cdot \frac{2\text{molH}_2\text{O}}{2\text{molH}_2} = 8\text{molH}_2\text{O}$$

1.0mol used

8-1= 7.0 moles of  $\text{H}_2$  left over

$$0.5\text{molO}_2 \cdot \frac{2\text{molH}_2}{1\text{molO}_2} = 1\text{molH}_2 \text{ used}$$

b.) (2 point) How many moles of a reactant(s), if any, is (are) leftover assuming reaction precedes 78%?

$$0.78 \cdot 0.5\text{molO}_2 = 0.39\text{mols is used so } 0.5 - 0.39 = 0.11\text{mol is unused}$$

$$0.78 \cdot 1.0\text{mol H}_2 = 0.78\text{mol H}_2 \text{ used so } 8 - 0.78 = 7.22\text{mol is unused}$$

7.22 moles leftover of  $\text{H}_2$

0.11mols leftover of  $\text{O}_2$

7.3 moles over all

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$A_r(\text{H})=1.00\text{g/mol}$   $A_r(\text{O})=15.99\text{g/mol}$