Name : _____ Date : _____

STOICHIOMETRY
PRACTICE WORKSHEET

1. Using the following equation:

$$2\ I_2 + KIO_3 + 6\ HCl \rightarrow 5\ ICl + KCl + 3\ H_2O$$

Calculate how many grams of iodine are needed to prepare 28.6 grams of ICl by this reaction.

2. Using the following equation:

$$5\ KNO_2 + 2\ KMnO_4 + 3\ H_2SO_4 \rightarrow 5\ KNO_3 + 2\ MnSO_4 + K_2SO_4 + 3\ H_2O$$

How many moles and grams of $KMnO_4$ are needed for this reaction on 11.4 grams of KNO_2?

3. Using the following equation:

$$4\ NH_3 + 5\ O_2 \rightarrow 4\ NO + 6\ H_2O$$

How many moles and grams of oxygen (O_2) are needed to react with 56.8 grams of ammonia by this reaction?

4. Using the following equation:

$$NaIO_3 + 6\ HI \rightarrow 3\ I_2 + NaI + 3\ H_2O$$

Calculate the number of moles and the number of grams of iodine (I_2) that can be made this way from 16.4 grams of $NaIO_3$.

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Answers

1. Using the following equation:

$$2\ I_2 + KIO_3 + 6\ HCl \rightarrow 5\ ICl + KCl + 3\ H_2O$$

Calculate how many grams of iodine are needed to prepare 28.6 grams of ICl by this reaction.

28.6 g ICl x (1 mol ICl/162.35 g ICl) x (2 mol I_2/5 mol ICl) x (253.8 g I_2/ 1 mol I_2) = 17.88 g I_2

2. Using the following equation:

$$5\ KNO_2 + 2\ KMnO_4 + 3\ H_2SO_4 \rightarrow 5\ KNO_3 + 2\ MnSO_4 + K_2SO_4 + 3\ H_2O$$

How many moles and grams of $KMnO_4$ are needed for this reaction on 11.4 grams of KNO_2?

11.4 g KNO_2 x (1 mol KNO_2/85.1 g KNO_2) x (2 mol $KMnO_4$/ 5 mol KNO_2)
= 0.054 mol $KMnO_4$

0.054 mol $KMnO_4$ x (158 g $KMnO_4$/1 mol $KMnO_4$) = 8.46 g $KMnO_4$

3. Using the following equation:

$$4\ NH_3 + 5\ O_2 \rightarrow 4\ NO + 6\ H_2O$$

How many moles and grams of oxygen (O_2) are needed to react with 56.8 grams of ammonia by this reaction?

56.8 g NH_3 x (1 mol NH_3/17 g NH_3) x (5 mol O_2/4 mol NH_3) = 4.18 mol O_2

4.18 mol O_2 x (32 g O_2/1 mol O_2) = 133.6 g O_2

4. Using the following equation:

$$NaIO_3 + 6\ HI \rightarrow 3\ I_2 + NaI + 3\ H_2O$$

Calculate the number of moles and the number of grams of iodine (I_2) that can be made this way from 16.4 grams of $NaIO_3$.

16.4 g $NaIO_3$ x (1 mol $NaIO_3$/197.9 g $NaIO_3$) x (3 mol I_2/ 1 mol $NaIO_3$) = 0.249 mol I_2

0.249 mol I_2 x (253.8 g I_2/1 mol I_2) = 63.1 g I_2