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WORKSHOP 10: Stoichiometry II
Section ________________

Show calculation setups and answers for all problems below.

1. Consider the balanced chemical equation to solve the following problems:

\[ 6 \text{KI} + 8 \text{HNO}_3 \rightarrow 6 \text{KNO}_3 + 2 \text{NO} + 3 \text{I}_2 + 4 \text{H}_2\text{O} \]

(a) If 26.0 g of KI are reacted, how many grams of I\(_2\) will be formed?

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(b) What volume of NO gas, measured at STP, will be produced if 39.0 g of HNO\(_3\) are reacted?

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(c) How many milliliters of 6.00 M HNO\(_3\) will react with 26.0 g of KI?

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(d) When the reaction produces 0.500 g of NO, how many molecules of I\(_2\) will be produced?

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(e) How many grams of iodine can be obtained by reacting 25.0 mL of 0.350 M KI solution?

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2. Consider the Haber Process for the synthesis of ammonia shown below. Use the given equation to solve the following problems:

\[
\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightarrow 2 \text{NH}_3(\text{g})
\]

(a) If 4.0 g of H\textsubscript{2} react, how many grams of NH\textsubscript{3} will be formed?

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(b) When 3.25 mol of N\textsubscript{2} react, what volume of NH\textsubscript{3}, measured at STP, will be formed?

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(c) What volume of NH\textsubscript{3} will be formed when 16.0 L of H\textsubscript{2} are reacted at STP?

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(d) How many molecules of NH\textsubscript{3} will be formed when 20.0 L of N\textsubscript{2} react at STP?

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(e) What volume of NH\textsubscript{3}, measured at 35 °C and 720. torr, will be produced from 12.0 g of H\textsubscript{2}?

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(f) If a mixture of 14.0 L of N\textsubscript{2} and 24.0 L of H\textsubscript{2} are reacted, what volume of NH\textsubscript{3} can be produced at STP?

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