

WORKSHEET ON STOICHIOMETRY

1. Convert the following number of moles of chemicals into their corresponding mass in grams.

A. 0.436 moles of ammonium chloride

B. 2.36 moles of lead (II) oxide

2. Dissolving lead (II) nitrate and potassium iodide in water will form lead (II) iodide and potassium nitrate.

A. Write the balanced equation for this reaction.

B. Calculate the grams of lead (II) iodide produced from 5 moles of potassium iodide.

C. Calculate the amount (in grams) of lead (II) iodide produced from 75 grams of potassium iodide.

3. Write and then balance the combustion reaction for propane gas, C_3H_8 .

A. If 5 grams of propane burn completely, what volume of carbon dioxide is produced at STP?

B. If 75 L of steam are produced at STP, what mass of propane must have burned?

C. If 34.2 grams of propane are completely combusted, how many moles of steam will that produce?

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Answers

1. Convert the following number of moles of chemicals into their corresponding mass in grams.

A. 0.436 moles of ammonium chloride

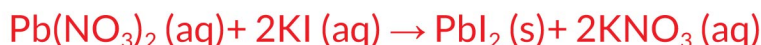
$$0.436 \text{ mol NH}_4\text{Cl} \times (53.49 \text{ g NH}_4\text{Cl} / 1 \text{ mol NH}_4\text{Cl}) = 23.32 \text{ g NH}_4\text{Cl}$$

B. 2.36 moles of lead (II) oxide

$$2.36 \text{ mol PbI}_2 \times (461.01 \text{ g PbI}_2 / 1 \text{ mol PbI}_2) = 1088 \text{ g PbI}_2$$

2. Dissolving lead (II) nitrate and potassium iodide in water will form lead (II) iodide and potassium nitrate.

A. Write the balanced equation for this reaction.



B. Calculate the grams of lead (II) iodide produced from 5 moles of potassium iodide.

$$5 \text{ mol KI} \times (1 \text{ mol PbI}_2 / 2 \text{ mol KI}) \times (461 \text{ g PbI}_2 / 1 \text{ mol PbI}_2) = 1150 \text{ g PbI}_2$$

C. Calculate the amount (in grams) of lead (II) iodide produced from 75 grams of potassium iodide.

$$75 \text{ g KI} \times (1 \text{ mol KI} / 166 \text{ g KI}) \times (1 \text{ mol PbI}_2 / 2 \text{ mol KI}) \times (461 \text{ g PbI}_2 / 1 \text{ mol PbI}_2) = 104.1 \text{ g PbI}_2$$

3. Write and then balance the combustion reaction for propane gas, C₃H₈.



A. If 5 grams of propane burn completely, what volume of carbon dioxide is produced at STP?

$$25 \text{ g C}_3\text{H}_8 \times (1 \text{ mol C}_3\text{H}_8 / 44.1 \text{ g C}_3\text{H}_8) \times (3 \text{ mol CO}_2 / 1 \text{ mol C}_3\text{H}_8) \times (22.4 \text{ L CO}_2 / 1 \text{ mol CO}_2) = 7.62 \text{ L CO}_2$$

B. If 75 L of steam are produced at STP, what mass of propane must have burned?

$$75 \text{ L H}_2\text{O} \times (1 \text{ mol H}_2\text{O} / 22.4 \text{ L H}_2\text{O}) \times (1 \text{ mol C}_3\text{H}_8 / 4 \text{ mol H}_2\text{O}) \times (44.1 \text{ g C}_3\text{H}_8 / 1 \text{ mol C}_3\text{H}_8) = 36.9 \text{ g C}_3\text{H}_8$$

C. If 34.2 grams of propane are completely combusted, how many moles of steam will that produce?

$$34.2 \text{ g C}_3\text{H}_8 \times (1 \text{ mol C}_3\text{H}_8 / 44.1 \text{ g C}_3\text{H}_8) \times (4 \text{ mol H}_2\text{O} / 1 \text{ mol C}_3\text{H}_8) = 3.1 \text{ mol H}_2\text{O}$$