

# SOLUTION STOICHIOMETRY

1. 60.0 mL of 0.322 M potassium iodide are combined with 20.0 mL of 0.530 M lead (II) nitrate. How many grams of lead (II) iodide will precipitate?

2. How many grams of calcium phosphate can be produced from the reaction of 2.50 L of 0.250 M calcium chloride with excess phosphoric acid?

3. How many mL of 1.50 M nitric acid is required to react with 100 g of cuprous oxide?

4. 60.5 mL of  $\text{HNO}_3$  react with 25.0 mL of a 1.00 M barium hydroxide solution. Write the balanced reaction. Find the molarity of the nitric acid solution.

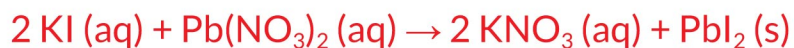
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# SOLUTION STOICHIOMETRY

## Answers

1. 60.0 mL of 0.322 M potassium iodide are combined with 20.0 mL of 0.530 M lead (II) nitrate. How many grams of lead (II) iodide will precipitate?



$$0.060 \text{ L KI} \times (0.322 \text{ mol KI}/1 \text{ L KI}) \times (1 \text{ mol PbI}_2/2 \text{ mol KI}) \times (461 \text{ g PbI}_2/1 \text{ mol PbI}_2) = 4.45 \text{ g PbI}_2$$

$$0.020 \text{ L Pb(NO}_3)_2 \times (0.530 \text{ mol Pb(NO}_3)_2/1 \text{ L Pb(NO}_3)_2) \times (1 \text{ mol PbI}_2/1 \text{ mol Pb(NO}_3)_2) \times (461 \text{ g PbI}_2/1 \text{ mol PbI}_2) = 4.89 \text{ g PbI}_2$$

The lower mass of  $\text{PbI}_2$  will precipitate.

2. How many grams of calcium phosphate can be produced from the reaction of 2.50 L of 0.250 M calcium chloride with excess phosphoric acid?



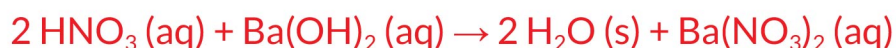
$$2.5 \text{ L CaCl}_2 \times (0.250 \text{ mol CaCl}_2/1 \text{ L CaCl}_2) \times (1 \text{ mol Ca}_3(\text{PO}_4)_2/3 \text{ mol CaCl}_2) \times (310 \text{ g Ca}_3(\text{PO}_4)_2/1 \text{ mol Ca}_3(\text{PO}_4)_2) = 64.6 \text{ g Ca}_3(\text{PO}_4)_2$$

3. How many mL of 1.50 M nitric acid is required to react with 100 g of cuprous oxide?



$$100 \text{ g Cu}_2\text{O} \times (1 \text{ mol Cu}_2\text{O}/143.1 \text{ mol Cu}_2\text{O}) \times (14 \text{ mol HNO}_3/3 \text{ mol Cu}_2\text{O}) \times (1000 \text{ mL HNO}_3/1.5 \text{ mol HNO}_3) = 2180 \text{ mL HNO}_3$$

4. 60.5 mL of  $\text{HNO}_3$  react with 25.0 mL of a 1.00 M barium hydroxide solution. Write the balanced reaction. Find the molarity of the nitric acid solution.



$$0.025 \text{ L Ba(OH)}_2 \times (1 \text{ mol Ba(OH)}_2/1 \text{ L Ba(OH)}_2) \times (2 \text{ mol HNO}_3/1 \text{ mol Ba(OH)}_2) = 0.05 \text{ mol HNO}_3$$

$$\text{Molarity} = 0.05 \text{ mol HNO}_3/0.0605 \text{ L HNO}_3 = 0.826 \text{ M}$$

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