

# SOLUTION STOICHIOMETRY

## WORKSHEET

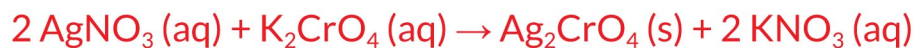
1. How many grams of silver chromate will precipitate when 150 mL of 0.5 M silver nitrate are added to 100 mL of 0.4 M potassium chromate?
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
2. How many mL of 0.280 M barium nitrate are required to precipitate as barium sulfate all the sulfate ions from 25.0 mL of 0.350 M aluminum sulfate?
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
3. 25.0 mL of 0.350 M NaOH are added to 45.0 mL of 0.125 M copper (II) sulfate. How many grams of copper (II) hydroxide will precipitate?
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
4. What volume of 0.415 M silver nitrate will be required to precipitate as silver bromide all the bromide ions in 35.0 mL of 0.128 M calcium bromide?

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### Answers

1. How many grams of silver chromate will precipitate when 150 mL of 0.5 M silver nitrate are added to 100 mL of 0.4 M potassium chromate?

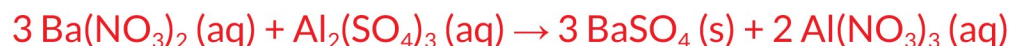


$$0.15 \text{ L AgNO}_3 \times (0.5 \text{ mol AgNO}_3 / 1 \text{ L AgNO}_3) \times (1 \text{ mol Ag}_2\text{CrO}_4 / 2 \text{ mol AgNO}_3) \\ \times (331.74 \text{ g Ag}_2\text{CrO}_4 / 1 \text{ mol Ag}_2\text{CrO}_4) = \boxed{12.4 \text{ g Ag}_2\text{CrO}_4}$$

$$0.1 \text{ L K}_2\text{CrO}_4 \times (0.4 \text{ mol K}_2\text{CrO}_4 / 1 \text{ L K}_2\text{CrO}_4) \times (1 \text{ mol Ag}_2\text{CrO}_4 / 1 \text{ mol K}_2\text{CrO}_4) \\ \times (331.74 \text{ g Ag}_2\text{CrO}_4 / 1 \text{ mol Ag}_2\text{CrO}_4) \\ = 13.3 \text{ g Ag}_2\text{CrO}_4$$

The lower amount of  $\text{Ag}_2\text{CrO}_4$  will precipitate.

2. How many mL of 0.280 M barium nitrate are required to precipitate as barium sulfate all the sulfate ions from 25.0 mL of 0.350 M aluminum sulfate?



$$0.025 \text{ L Al}_2(\text{SO}_4)_3 \times (0.35 \text{ mol Al}_2(\text{SO}_4)_3 / 1 \text{ L Al}_2(\text{SO}_4)_3) \times (3 \text{ mol Ba}(\text{NO}_3)_2 / 1 \text{ mol Al}_2(\text{SO}_4)_3) \\ \times (1 \text{ L Ba}(\text{NO}_3)_2 / 0.280 \text{ mol Ba}(\text{NO}_3)_2) = 93.8 \text{ mL Ba}(\text{NO}_3)_2$$

3. 25.0 mL of 0.350 M NaOH are added to 45.0 mL of 0.125 M copper (II) sulfate. How many grams of copper (II) hydroxide will precipitate?



$$0.025 \text{ L NaOH} \times (0.35 \text{ mol NaOH} / 1 \text{ L NaOH}) \times (1 \text{ mol Cu}(\text{OH})_2 / 2 \text{ mol NaOH}) \\ \times (97.57 \text{ g Cu}(\text{OH})_2 / 1 \text{ mol Cu}(\text{OH})_2) = \boxed{0.427 \text{ g Cu}(\text{OH})_2}$$

$$0.045 \text{ L CuSO}_4 \times (0.125 \text{ mol CuSO}_4 / 1 \text{ L CuSO}_4) \times (1 \text{ mol Cu}(\text{OH})_2 / 1 \text{ mol CuSO}_4 (\text{aq})) \\ \times (97.57 \text{ g Cu}(\text{OH})_2 / 1 \text{ mol Cu}(\text{OH})_2) = 0.549 \text{ g Cu}(\text{OH})_2$$

The lower amount of  $\text{Cu}(\text{OH})_2$  will precipitate.

4. What volume of 0.415 M silver nitrate will be required to precipitate as silver bromide all the bromide ions in 35.0 mL of 0.128 M calcium bromide?



$$0.035 \text{ L CaBr}_2 \times (0.128 \text{ mol CaBr}_2 / 1 \text{ L CaBr}_2) \times (2 \text{ mol AgNO}_3 / 1 \text{ mol CaBr}_2) \\ \times (1 \text{ L AgNO}_3 / 0.415 \text{ L AgNO}_3) = 21.6 \text{ mL AgNO}_3$$