

4.6 Introduction to Titration Worksheet

Write balanced net ionic equations for the chemical reactions in questions 1 through 6.

- 1) A solution of sodium dichromate, $\text{Na}_2\text{Cr}_2\text{O}_7$, is added to an acidic solution containing Fe^{2+} ions.
- 2) Acidic solutions of potassium permanganate, KMnO_4 , and sodium sulfite, Na_2SO_3 , are mixed.
- 3) Concentrated hydrochloric acid, HCl , is poured into a solution of potassium dichromate, $\text{K}_2\text{Cr}_2\text{O}_7$.
- 4) Acidic solutions of potassium permanganate, KMnO_4 , and hydrogen peroxide, H_2O_2 , are mixed.
- 5) Solutions of nitric acid, HNO_3 , and barium sulfite, BaSO_3 , are mixed.
- 6) Acidified solutions of sodium dichromate, $\text{K}_2\text{Cr}_2\text{O}_7$, and copper (I) bromide, CuBr , are mixed.
- 7) Write the balanced reduction half-reaction for the decomposition of hydrogen peroxide.
- 8) Hydrogen gas is blown over hot iron (II) oxide.
 - a. Write the balanced reduction half reaction that occurs.
 - b. Write the balanced oxidation half reaction that occurs.
 - c. Write the balanced net ionic equation for this reaction.

Write balanced net ionic equations for the chemical reactions in questions 9 through 11.

- 9) Basic solutions of iron (II) chloride and potassium permanganate, KMnO_4 are mixed.
- 10) Basic solutions of sodium sulfite, Na_2SO_3 , and potassium permanganate, KMnO_4 , are mixed.
- 11) Concentrated hydrochloric acid, HCl , is poured over solid potassium permanganate, KMnO_4 .

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- 12) A 0.0500 M solution of potassium permanganate was used to titrate 250.0 mL of a platinum (II) chloride solution with an unknown concentration. The endpoint was reached after 26.87 mL of 0.0500 M KMnO_4 was delivered.
 - a. Write the balanced net ionic equations for the chemical reaction that occurred during this titration.
 - b. How many moles of KMnO_4 were delivered when the endpoint was reached?
 - c. How many moles of platinum (II) chloride were contained in the 250.0 mL sample?
 - d. Calculate the experimentally determined molar concentration (mol/L) of platinum (II) chloride in solution.