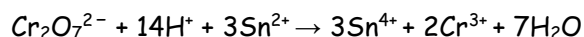


Redox Titrations

- Which of the following could be used to determine the $[\text{Fe}^{+2}]$ by a redox reaction?
A. I_2 B. Cl^- C. Cu^{2+} D. MnO_4^- (acidified)
- Which of the following could be used to determine the acidified $[\text{BrO}_3^-]$ by a redox reaction?
A. NO_3^- (acidified) B. I^- C. Cu^{2+} D. MnO_4^- (acidified)
- Which of the following could be titrated using acidified MnO_4^- ions?
A. Na^+ B. IO_3^- C. SO_4^{2-} D. H_2O_2
- The titration of a 25.0 mL SnCl_2 sample, in acidic solution, requires 14.4 mL of 0.030 M $\text{K}_2\text{Cr}_2\text{O}_7$. The balanced equation for the reaction is shown below:

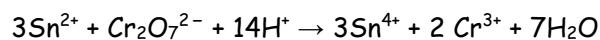


What is the number of moles of SnCl_2 in the original sample?

- A. $1.4 \times 10^{-4} \text{ mol}$ B. $4.3 \times 10^{-4} \text{ mol}$ C. $1.3 \times 10^{-4} \text{ mol}$ D. $5.2 \times 10^{-2} \text{ mol}$
- A 10.0 mL water sample was analyzed for $[\text{Fe}^{+2}]$ using a redox titration with acidified KMnO_4 . The equation for the reaction is:
$$\text{MnO}_4^- + 5\text{Fe}^{2+} + 8\text{H}^+ \rightarrow \text{Mn}^{2+} + 5\text{Fe}^{3+} + 4\text{H}_2\text{O}$$
- A 10.0 mL sample was titrated with 12.5 mL of 0.10 M KMnO_4 solution. What is the $[\text{Fe}^{+2}]$ in the water sample?
- A. 0.025 M B. 0.13 M C. 0.28 M D. 0.63 M

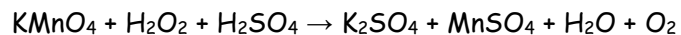
Please do the following on a separate piece of paper.

- Acidified potassium permanganate (KMnO_4) solution is often used in redox titrations. Permanganate reacts with Sn^{+2} as follows:
$$2\text{MnO}_4^- + 5\text{Sn}^{2+} + 16\text{H}^+ \rightarrow 2\text{Mn}^{2+} + 5\text{Sn}^{4+} + 8\text{H}_2\text{O}$$
- A 10.0 mL solution containing Sn^{+2} is titrated with 19.3 mL of 0.10 M KMnO_4 . What is the $[\text{Sn}^{+2}]$?
- In the process of extracting tin from a sample of ore, the tin is removed as Sn^{2+} ions. A titration requires 21.43 mL of 0.0170 M $\text{K}_2\text{Cr}_2\text{O}_7$ to reach the equivalence point with the Sn^{2+} in a 0.750 g sample of the ore.



Using the reaction above, calculate the percent mass of tin in the ore sample.

8. Consider the following redox reaction in acidic solution:



a. Balance the above redox reaction.

b. The above reaction was used for a redox titration. At the equivalence point 5.684×10^{-4} mol KMnO_4 was required to titrate 5.00 mL of H_2O_2 solution. Calculate $[\text{H}_2\text{O}_2]$.

9. A titration is performed to determine the $[\text{Fe}^{+2}]$ in 25.00 mL of an FeSO_4 solution. It requires 22.52 mL of 0.015 M KMnO_4 to reach the equivalence point in which Mn^{+2} and Fe^{+3} are produced.

a. balance the redox reaction: $\text{MnO}_4^- + \text{Fe}^{2+} \rightarrow \text{Mn}^{2+} + \text{Fe}^{3+}$ (acidic)

b. Calculate the $[\text{Fe}^{+2}]$