

Redox Stoichiometry (Titrations)

- In a redox titration, a known concentration of an oxidizing agent is used to find an unknown concentration of a reducing agent, or vice-versa.
- Applications include finding the iron content of water or the Vitamin C content in foods.

General Steps:

1. Balance the redox equation
2. Organize data for the given and required substances
3. Find the moles of the given substance
If given volume and concentration, use $n = Cv$
If given mass, find molar mass, then use $n = m/M$
4. Find the moles of the required substances, using mole ratio
5. Convert moles to concentration ($C = n/v$) or volume ($v = n/C$) or mass ($m = nM$) of required substance

Example 1:

The following example involves the titration of a solution of sodium oxalate, $\text{Na}_2\text{C}_2\text{O}_4(\text{aq})$ with a solution of potassium permanganate, $\text{KMnO}_4(\text{aq})$.

Important Note:

- The permanganate ion, MnO_4^- , is often used as an oxidizing agent because of its deep purple color.
- It acts as its own indicator.
- It is reduced to pale pink Mn^{2+} by the oxalate ions.
- Once all oxalate ions have been oxidized the next drop of permanganate ions turns the solution a faint purple color, signaling the endpoint of the titration.

Find the **volume** of 0.200 M solution of MnO_4^- which will react with 50.0 mL of 0.100 M solution of $\text{C}_2\text{O}_4^{2-}$.



Example 2:

A 23.30 ml sample of KMnO_4 solution is decolorized by 0.1111g of oxalic acid ($\text{H}_2\text{C}_2\text{O}_4$). The products are Mn^{2+} and CO_2 gas. Calculate the concentration of KMnO_4 using the following equation:

Example 3:

The oxidation of Fe^{2+} ions by permanganate in acidic solution is accompanied by the formation of Fe^{3+} ions and Mn^{2+} ions. How many moles of FeSO_4 would be oxidized by 100.0 ml of 0.02118 mol/L KMnO_4 solution.



Redox Stoichiometry Worksheet

T. R. Dickson

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the author's name.

Redox Stoichiometry Worksheet:

The Enigmatic Realm of **Redox Stoichiometry Worksheet**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing in short supply of extraordinary. Within the captivating pages of **Redox Stoichiometry Worksheet** a literary masterpiece penned by way of a renowned author, readers set about a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting impact on the hearts and minds of people who partake in its reading experience.

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