

Solutions

Q.No	Question	Marks
Free Response Questions/Subjective Questions		
Q.1	The equivalent mass of KMnO_4 in acidic medium is less than that in neutral medium. Explain.	2

Answer Key & Marking Scheme

Q.No	Answers	Marks
Q.1	<p>Molar mass of $\text{KMnO}_4 = 158$</p> <p>$\text{MnO}_4^- + 8\text{H}^+ + 5\text{e}^- \rightarrow \text{Mn}^{+2} + 4\text{H}_2\text{O}$</p> <p>In acidic medium,</p> <p>No. of electrons gained = 5</p> <p>Equivalent mass of $\text{KMnO}_4 = \text{Molecular mass/no. of electrons gained} = 158/5 = 31.6$</p> <p>In neutral medium,</p> <p>$2\text{KMnO}_4 + \text{H}_2\text{O} + 3\text{e}^- \rightarrow 2\text{MnO}_2 + 2\text{KOH} + 3[\text{O}]$</p> <p>No. of electrons gained = 3</p> <p>Equivalent mass of $\text{KMnO}_4 = \text{Molecular mass/no. of electrons gained} = 158/3 = 52.67$</p> <p>Thus, the equivalent mass of KMnO_4 in acidic medium is less than that in neutral medium.</p> <p><i>[Give 1 mark each for the calculation of equivalent weight in acidic and neutral medium.]</i></p>	2

