



REDOX REACTIONS

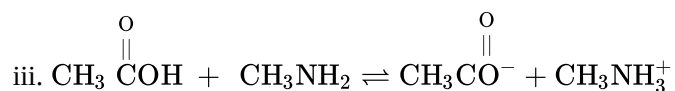
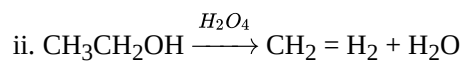
Class 11 - Chemistry

Time Allowed: 1 hour and 30 minutes

Maximum Marks: 45

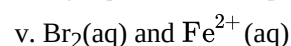
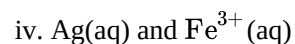
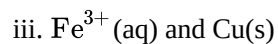
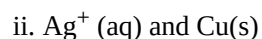
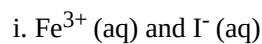
1. Define reduction reaction. [1]
2. Following cell is set up between copper and silver electrodes. [1]
$$\text{Cu}|\text{Cu}^{2+}(\text{aq})||\text{Ag}^{+}(\text{aq})|\text{Ag}$$

If its two half-cells work under standard conditions, calculate the emf of the cell.
[Given $E^{\circ}_{\text{Cu}^{2+}/\text{Cu}} = +0.34 \text{ V}$, $E^{\circ}_{\text{Ag}^{+}/\text{Ag}} = +0.80 \text{ V}$]
3. Name one strongest oxidizing agent? [1]
4. What is the most essential condition that must be satisfied in a redox reaction? [1]
5. Define disproportionation reaction. [1]
6. Define oxidation reaction. [1]
7. Define an oxidizing agent. Name the best oxidizing agent. [1]
8. Does the oxidation number of an element in any molecule or any polyatomic ion represent the actual charge on it? [1]
9. What is the oxidation number of Mn in KMnO_4 ? [1]
10. Represent a galvanic cell in electrode and ions containing Cu electrode dipped in molar solution of copper sulphate and silver electrode dipped in molar solution of silver nitrate. [1]
[Given $E^{\circ}_{\text{Cu}^{2+}/\text{Cu(s)}} = 0.34 \text{ V}$, $E^{\circ}_{\text{Ag}^{+}/\text{Ag(s)}} = 0.80 \text{ V}$]
11. Depict the galvanic cell in which the reaction $\text{Zn(s)} + 2\text{Ag}^{+}(\text{aq}) \longrightarrow \text{Zn}^{2+}(\text{aq}) + 2\text{Ag(s)}$ takes place, Further show: [3]
 - i. which of the electrode is negatively charged,
 - ii. the carriers of the current in the cell, and
 - iii. individual reaction at each electrode.
12. Using Stock notation, represent the following compounds: HAuCl_4 , Tl_2O , FeO , Fe_2O_3 , CuI , CuO , MnO , and MnO_2 . [3]
13. In the reactions given below, identify the species undergoing oxidation and reduction. [3]
 - i. $\text{H}_2\text{S(g)} + \text{Cl}_2(\text{g}) \rightarrow 2\text{HCl(g)} + \text{S(s)}$
 - ii. $3\text{Fe}_3\text{O}_4(\text{s}) + 8 \text{Al(s)} \rightarrow 9 \text{Fe(s)} + 4\text{Al}_2\text{O}_3(\text{s})$
 - iii. $2\text{Na(s)} + \text{H}_2(\text{g}) \rightarrow 2\text{NaH(s)}$
14. Decide whether each of the following reaction involves oxidation reduction reaction or not. If it does, identify which species is oxidised and which gets reduced? [3]
 - i. $4\text{CH}_3\overset{\text{O}}{\parallel}\text{CCH}_3 + \text{LiAlH}_4 + 4\text{H}_2\text{O} \rightleftharpoons 4\text{CH}_3\overset{\text{O}}{\parallel}\text{CHCH}_3 + \text{LiOH} + \text{Al(OH)}_3$

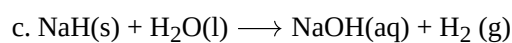
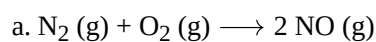


15. Justify giving reactions that among halogens, fluorine is the best oxidant and among hydrohalic compounds, hydroiodic acid is the best reductant. [3]

16. Using the standard electrode potentials given below, predict if the reaction between the following is feasible or not. [5]



17. Suggest a scheme of classification of the following redox reactions [5]



18. Chlorine is used to purify drinking water. Excess of chlorine is harmful. The excess of chlorine is removed by treating with sulphur dioxide. Present a balanced equation for this redox change taking place in water. [5]

19. Suggest a list of the substances where carbon can exhibit oxidation states from -4 to +4 and nitrogen from -3 to +5. [5]