CHAPTER 10

ELECTROCHEMISTRY

MCQS

Q.1 Electrolysis is the process in which a chemical reaction takes place at the expense of

(a) chemical energy (b) electrical energy

(c) heat energy (d) none of these

Q.2 Standard hydrogen electrode has an arbitrarily fixed potential

(a) 0.00 volt (b) 1.00 volt

(c) 0.10 volt (d) none of these

Q.3 The oxidation number of chromium in $K_2Cr_2O_7$ is

(a) 14 (b) 12

(c) 6 (d) none of these

Q.4 In the reaction $2Fe + Cl_2 \rightleftharpoons 2FeCl_3$

(a) Fe is reduced (b) Fe is oxidized

(c) Cl_2 is oxidized (d) none of these

Q.5 When fused $PbBr_2$ is electrolyzed

(a) bromine appears at cathode

(b) lead is deposited at the cathode

(c) lead appears at the anode

(d) none of these happens

Q.6 When aqueous solution of NaCl is electrolysed

(a) Cl_2 is evolved at the cathode

(b) H_2 is evolved at cathode

(c) Na is deposited at the cathode

(d) Na appears at the anode

Q.7 During electrolysis of KNO_3, H_2 is evolved at

(a) anode (b) cathode
(c) both (a) and (b) (d) none of these

Q.8 During electrolysis of CuSO4 (aq) using Cu electrodes Cu is deposited at
(a) anode (b) cathode
(c) both (a) and (b) (d) none of these

Q.9 During electrolysis of fused NaCl, which of the following reaction occurs at anode
(a) Cl– ions oxidized (b) Cl– ions reduced
(c) Na+ ions oxidized (d) Na+ ions reduced

Q.10 An electrochemical cell is based upon
(a) acid–base reaction (b) redox reaction
(c) nuclear reaction (d) none of the above

Q.11 Which one of the following will be good conductor of electricity
(a) pure distilled water (b) molten NaCl
(c) dilute solution of glucose
(d) chloroform

Q.12 Which one of the following represents the same net reaction as the electrolysis of aqueous H2SO4
(a) electrolysis of water
(b) electrolysis of molten NaCl
(c) electrolysis of aqueous HCl
(d) electrolysis of aqueous NaCl

Q.13 In a galvanic cell, the reaction occurs
2H2O (O2 (g) + 4H+ + 4e– It occurs at the
(a) cathode (b) anode
(c) cathode and anode (d) none of the above

Q.14 Which statement below is not true for the reaction
Fe3+ + e– (Fe2+

(a) Fe3+ is reduced
(b) oxidation state of Fe has changed
(c) Fe3+ can act as an oxidizing agent
(d) both Fe2+ and Fe3+ are called anions

Q.15 During a redox reaction, an oxidizing agent
(a) gains electrons (b) is oxidized
(c) loses electrons (d) is hydrolysed

Q.16 In a salt bridge KCl is used because
(a) it is an electrolyte
(b) K+ and Cl– transfer easily
(c) agar–agar forms a good jelly with it
(d) KCl is also present in the calomel electrode

Q.17 A oxidizing agent is a substance which brings about
(a) electron donation (b) oxidation
(c) reduction (d) hydrolysis

Q.18 In the electrolysis the process of oxidation occurs at
(a) anode (b) cathode
(c) both cathode and anode
(d) in electrolytic solution

Q.19 In an oxidation process the oxidation number of the element
(a) increases (b) decreases
(c) does not change (d)

Q.20 In the reduction process the oxidation number of the element
(a) increases (b) decreases
(c) does not change (d)

Q.21 Oxidation number of oxygen in OF2 is
(a) + 1 (b) – 1
(c) + 2 (d) – 2

Q.22 The e.m.f. of Zn – Cu cell is

(a) 1.10 v (b) 1.5 v
(c) 2.0 v (d) 2.5 v

Q.23 The standard reduction potential of a standard hydrogen electrode
(a) 0.0 v (b) 1.1 v
(c) 1.5 v (d) 2.0 v

Q.24 The oxidation number of Mn is K2 MnO4 is
(a) + 2 (b) + 4
(c) + 6 (d) + 7

Q.25 Which of the following is the definition of oxidation
(a) gain of electrons (b) loss of electrons
(c) addition of H2 (d) removal of O2

Q.26 During electrolysis of H2SO4 (aq) O2 is evolved at
(a) cathode (b) anode
(c) both a and b (d) none of these

Q.27 The e.m.f. produced by a voltage cell is
(a) electrode potential (b) reduction potential
(c) cell potential (d) oxidation potential

Q.28 Which of the following is not a redox reaction
(a) CaCO3 (CaO + CO2
(b) Cu + 4HNO3 (Cu(NO3)2 + 2NO2 + H2O
(c) 2H2 + O2 (2H2O
(d) MnO2 + 4HCl (MnCl2 + Cl2 + 2H2O

Q.29 Which element acts as a reducing agent in the reaction
Zn + H2SO4 (ZnSO4 + H2
(a) Zn (b) H
(c) S (d) O

Q.30 Which element acts as a oxidizing agent in the reaction
MnO2 + 4HCl (MnCl2 + Cl2 + 2H2O

(a) Mn (b) O
(c) H (d) Cl

Q.31 When the current is passed through an electrolytic solution, which of the following process will occur
(a) anions move towards anode and cations move towards cathode
(b) cations and anions both move towards anode
(c) cations and anions both move towards anode
(d) no movement of the ions occur

Q.32 Electric current passes through both molten and solution form of NaCl because of
(a) ionic bonding (b) Na+ and Cl– ions
(c) ions of water (d) hydration of ions

Q.33 A cell which produces electric current by redox reaction is called
(a) standard cell (b) voltaic cell
(c) reversible cell (d) concentration cell

Q.34 Which of the following conduct electricity due to the migration of electrons only
(a) copper metal (b) NaCl molten
(c) NaCl (d) NaCl solution

Q.35 Oxidation number of sulphur in S2O eq \a\co1(2–,3) is
(a) + 6 (b) – 2
(c) + 2 (d) + 4

Q.36 Substances through which electric current can pass are called
(a) insulators (b) conductors
(c) cathode (d) anode

Q.37 Substances through which electric current cannot pass are called
(a) insulators (b) conductors
(c) anode (d) cathode

Q.38 Metallic conduction is due to the

(a) movement of electrons
(b) movement of ions
(c) both (a) and (b)
(d) none of these

Q.39 Metallic conductors conduct electricity
(a) with chemical change
(b) without any chemical change
(c) both (a) and (b)
(d) none of these

Q.40 The flow of electrons is called
(a) electrolyte (b) electric current
(c) cathode (d) anode

Q.41 A substance which in molten state or in solution form allows electric current to pass through it is called
(a) electrolyte (b) insulator
(c) conduction (d) none of these

Q.42 The process in which electric current is used to carry out a non–spontaneous redox reaction is called
(a) electrolyte (b) electrolysis
(c) metallic conductor (d) electrodes

Q.43 In electrochemical cells, the electrode at which the reduction occurs is called
(a) anode (b) cathode
(c) electrolyte (d) electrolysis

Q.44 The process of producing a chemical change in an electrolytic cell is called
(a) electrolyte (b) electrolysis
(c) electrodes (d) conductor

Q.45 The process in which ionic compound when fused or dissolved

in water split up into charged particles is called
(a) electrolysis (b) hydration
(c) ionization (d) conduction

Q.46 An apparatus in which chemical energy in converted to electrical energy is called
(a) electrolytic cell (b) galvanic cell
(c) fuel cell (d) down cell

Q.47 The metallic conductors in contact with the solution are called
(a) insulator (b) electrodes
(c) electrolyte (d) down cell

Q.48 The reaction in a galvanic cell is
(a) spontaneous (b) non–spontaneous
(c) acid–base (d) none of these

Q.49 Caustic soda is obtained by electrolysis of conc. aqueous solution of NaCl in a cell called
(a) Daniell's cell (b) Nelson's cell
(c) Down's cell (d) Voltaic cell

Q.50 Sodium metal is obtained by the electrolysis of fused NaCl in a cell is called
(a) Nelson's cell (b) Down's cell
(c) Daniell cell (d) Voltaic cell

Q.51 The e.m.f. of Daniell cell can be increased by
(a) increasing the area of electrode
(b) increasing the concentration of oxidising ion in the solution
(c) increasing the concentration of reducing ion in the solution
(d) adding the dil H2SO4

Q.52 Metal and their ionic salts both conduct electricity. Which of the following statement is not correct both
(a) are good conductors normally

(b) are ionic in nature
(c) decompose on passing current
(d) are normally solid

Q.53 The branch of chemistry which deals with the relationships between electricity and chemical reaction is called
(a) chemical kinetics (b) electrochemistry
(c) stiochiometry (d) thermochemistry

Q.54 A system containing of electrodes that dips into an electrolyte in which a chemical reaction either uses or generates an electric current is called
(a) voltaic cell (b) electrochemical cell
(c) voltaic or galvanic cell (d) fuel cell

Q.55 A cell in which spontaneous redox reaction generates an electric current is called
(a) electrolytic cell
(b) electrochemical cell
(c) voltaic orgalvanic cell
(d) biological cell

Q.56 A cell in which an electric current drives a non–spontaneous reaction is called
(a) electrolytic cell (b) voltaic cell
(c) biological cell (d) electrochemical cell

Q.57 A process for converting one metal with a thin layer of another metal is called
(a) electrolysis (b) electroplating
(c) electrode potential (d) standard electrode

Q.58 In an electrical connection between cathode and anode of a voltaic cell, electrons flow from the
(a) anode to the cathode (b) cathode to the anode

(c) both (a) and (b) (d) none of these

Q.59 Greater the value of standard reduction potential of a species indicates

(a) greater its tendency to accepted electrons

(b) lesser tendency to accept electrons

(c) greater tendency to lose electrons

(d) none of these

Q.60 In lead accumulator the electrolyte H_2SO_4 solution is

(a) 30 % (b) 60% H_2SO_4

(c) 80% (d) 90%

Q.61 In alkaline battery, the electrolyte contains

(a) MnO_2 (b) KOH

(c) NaCl (d) $NaNO_3$

Q.62 Alkali metals have

(a) lower value of reduction potential than coinage metals

(b) higher value of reduction potential than coinage metals

(c) equal values of reduction potential to coinage metals

(d) none of these

Q.63 Strong reducing agents have

(a) greater positive value of standard reduction potential

(b) greater negative value of standard reduction potential

(c) lesser positive value of standard reduction potential

(d) none of these

Q.64 Strong oxidizing agents have

(a) greater positive value of standard reduction potential

(b) lesser positive value of standard reduction potential

(c) greater negative value of standard reduction potential

(d) none of these

Q.65 The electrode with more negative value of reduction potential acts as

(a) cathode (b) anode

(c) electrode (d) none of these

Q.66 Metals which are above SHE in electrochemical series

(a) can liberate H2 from acid

(b) cannot liberate H2 from acid

(c) cannot always liberate H2 from acid

(c) none of these

Q.67 Corrosion reactions are

(a) spontaneous redox reactions

(b) non–spontaneous redox reactions

(c) spontaneous acid–base reactions

(d) none of these

Q.68 Voltaic cell can be changed into

(a) electrochemical cell (b) electrolytic cell

(c) reversible cell (d) primary cell

Q.69 Strongest oxidizing agent in the electrochemical series is

(a) Li (b) F

(c) H2 (d) I2

Q.70 Strongest reducing agent in the electrochemical series is

(a) Li (b) F

(c) H2 (d) I2

Q.71 Fuel cells are the means by which chemical energy may be converted into

(a) heat energy (b) electrical energy

(c) mechanical energy (d) sound energy

ANSWERS

Questions 1 2 3 4 5 Answers b a c b b Questions 6 7 8 9 10 Answers b b b a b Questions 11 12 13 14 15 Answers b a b d a Questions 16 17 18 19 20 Answers b c a a b Questions 21 22 23 24 25 Answers c a a c b Questions 26 27 28 29 30 Answers b c a a a Questions 31 32 33 34 35 Answers a b b a c Questions 36 37 38 39 40 Answers b a a b b Questions 41 42 43 44 45 Answers a b b b c Questions 46 47 48 49 50 Answers b b a b b Questions 51 52 53 54 55 Answers c b b b c Questions 56 57 58 59 60 Answers a b a a a Questions 61 62 63 64 65 Answers b a b a b Questions 66 67 68 69 70 Answers a a c b a Questions 71 Answers b