Date :
Marks :

TEST ID: XIICH0602
CHEMISTRY

6.GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

Single Correct Answer Type

31. Which pair of elements can form alloy?
a) Zn and Pb b) Fe and Hg c) Fe and C d) C and Pt
32. Which ore can be best concentrated by froth floatation process?
a) Malachite b) Cassiterite c) Galena d) Magnetite
33. The mass of carbon anode consumed (giving only carbon dioxide) in the production of 270 kg of aluminium metal from bauxite by the hall process is
(Atomic mass of Al=27)
a) 180kg b) 270 kg c) 540 kg d) 90 kg
34. Carbon monoxide reduction process is used for the extraction of:
a) Cu b) Ag c) Na d) K
35. Load stone is one ore of
a) Iron b) Lead c) Silicon d) Tin
36. One of the following metals forms a volatile compound and this property is taken advantage for its extraction. This metals is
a) Cobalt b) Iron c) Tungsten d) Nickel
37. Carbon reduction is used for the extraction of:
a) Fe b) K c) Al d) None of these
38. The phenomenon in which white transparent crystal changes into white powder is known as:
a) Sublimation b) Allotropy c) Efflorescence d) deliquescence
39. Which is used for the extraction of cadmium from cadmium sulphide?
a) Roasting b) Reduction c) Oxidation d) Electrolysis
40. Formula of magnetite is
a) Fe_3O_4 b) Fe_2O_3 c) FeS_2 d) $FeCO_3$
41. When MnO_2 is fused with KOH, a coloured compound is formed, the compound and its colour is:
a) K_2MnO_4, purple green
b) $KMnO_4$, purple
c) Mn_2O_3, brown
d) Mn_3O_4, black
42. Which is not a basic flux?
a) $CaCO_3$ b) CaO c) SiO_2 d) MgO
43. An ore of tin containing $FeCrO_4$ is concentrated by:
a) Magnetic separation b) Froth floatation c) Electrostatic method d) Gravity separation
44. Orford process is used in extraction of:
a) Pt b) Co c) Fe d) Ni
45. The salt which is least likely to be found in minerals is:
a) Sulphate b) Acetate c) Chloride d) Sulphide
46. The second most common element on the earth is:
a) Silicon b) Hydrogen c) Nitrogen d) Oxygen
47. An ore of tin containing $FeCrO_4$ is concentrated by
a) Electrostatic method b) Gravity separation c) Magnetic separation d) Forth floatation
48. Alkaline earth metals are not found free in nature because of:
a) Their high b. p.
b) Their low b. p.

c) Thermal instability
d) Their great chemical activity

49. Alloy is an example of:
a) Gel b) Aerosol c) Solid sol d) Emulsion

50. Cinnabar is an ore of
a) Pb b) Hg c) Cu d) Zn

51. Which element occurs in free state in nature?
a) Fe b) Co c) Pt d) Ni

52. Aluminothermic process is used for the extraction of metals, whose oxides are:
a) Fusible
b) Not easily reduced by carbon
c) Not easily reduced by hydrogen
d) Strongly basic

53. Bauxite ore is concentrated by
a) Froth floatation b) Electromagnetic separation
c) Chemical separation d) Hydraulic separation

54. Which process is used for benefication of ores?
a) Process of removal of impurities
b) Process of heating ore at high temperature
c) Extraction of metal from ore
d) None of the above

55. Extraction for zinc from zinc blende is achived by
a) Electrolytic reduction
b) Roasting following by reduction with carbon
c) Roasting followed by reduction with another metal
d) Roasting followed by self-reduction

56. Auto-reduction process is used in the extraction of
a) Cu and Hg b) Zn and Hg c) Cu and Al d) Fe and Pb

57. Thomas slag is
a) $Ca_3(PO_4)_2.2H_2O$ b) $Ca_3(PO_4)_2.CaSiO_3$ c) $MgSiO_3$ d) $CaSiO_3$

58. Metals are good conductors of electricity because they contain
a) Ionic bonds b) A network structure
c) Very few valence electrons d) Free electrons

59. Liquation is used to purify:
a) Hg b) Sn c) Bi d) All of these

60. The most abundant metal in the earth crust is:
a) Na b) Ca c) Al d) Fe

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GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

ANSWER KEY

31)	c	32)	c	33)	d	34)	a
35)	a	36)	d	37)	a	38)	c
39)	b	40)	a	41)	a	42)	c
43)	a	44)	d	45)	b	46)	a
47)	c	48)	d	49)	c	50)	b
51)	c	52)	b	53)	c	54)	a
55)	b	56)	a	57)	b	58)	d
59)	d	60)	c				

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GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

HINTS AND SOLUTIONS

31 **(c)**
Fe-C form alloy.

32 **(c)**
Galena is PbS; Sulphide ores are concentrated by froth floatation process.

33 **(d)**
In Hall and Heroult process,

$$2Al_2O_3 \rightarrow 4Al + 3O_2$$

$$4C + 3O_2 \rightarrow 2CO_2 + 2CO \uparrow$$

$$2Al_2O_3 + 4C \rightarrow 4Al + 2CO_2 + 2CO$$

Only for removal of CO_2, following equation is possible

$$2Al_2O_3 + 3C \rightarrow 4Al + 3CO_2$$

$$3 \times 12 = 36 \qquad 4 \times 27 = 108$$

$\because$For 108 g of Al, required amount of C $= 36$g

$\therefore$ For 270 g of required amount of $C = \frac{36}{108} \times 270 = 90$g

34 **(a)**

$$CuO + CO \xrightarrow{\Delta} Cu + CO_2 \uparrow$$

35 **(a)**
Load stone (magnetite, Fe_3O_4) is an ore of iron

36 **(d)**
Mond's process for refining of Ni is an example of vapour phase refining

37 **(a)**
Carbon reduction process is used for extraction of less electropositive metals like Pb, Fe, Zn, Sb, Cu, etc., from their ores.

38 **(c)**
The phenomenon of efflorescence involves spontaneous loss of water molecules from a crystal.

39 **(b)**
Cd is found as traces in most Zn ores, and is extracted from these.

$$Zn_{(solid)} + Cd^{2+}_{(solution)} \rightarrow Zn^{2+}_{(solution)} + Cd_{(solid)}; E^\circ = 0.36\ V$$

41 **(a)**

$$2MnO_2 + 4KOH + O_2 \longrightarrow \underset{\text{Purple green}}{2K_2MnO_4} + 2H_2O$$

42 **(c)**
SiO_2 is an acidic flux.

43 **(a)**
$FeCrO_4$ is magnetic impurity.

44 **(d)**
Extraction of Ni involves Electrolytic Process, Oxford Process, Mond's Process and German Process.4

45 **(b)**
Acetate of all metals are soluble in water.

46 **(a)**

____do___

47 **(c)**
Electromagnetic separation is used when either the ore or the impurities associated with it, are magnetic in nature

48 **(d)**
Alkaline earth metals are very reactive and are found in combined state only in nature.

49 **(c)**
Dispersion of solid in solid is called solid sol.

51 **(c)**
Pt is noble metal, other noble metals are Au, Ag.

52 **(b)**
Alumino-thermic process is commonly used for those metals which have very high m.pt. and are to be extracted from their oxides and their reduction with carbon is not satisfactory.

53 **(c)**
Bauxite ore is concentrated by chemical separation or leaching. In this, powdered ore is treated with a suitable reagent which can dissolve the ore but not the impurities

54 **(a)**
Dressing or benefication of ore involves removal of impurities from ore.

55 **(b)**
Zinc blende is roasted and then treated with coke for the reduction

$3ZnS + 3O_0 \xrightarrow{\Delta} 2ZnO + 2SO_2 \uparrow$

$ZnO + C \xrightarrow{\Delta} Zn + CO \uparrow$

56 **(a)**

$2HgS + 3O_2 \rightarrow 2HgO + 3SO_2$

$2HgO \xrightarrow{\Delta} 2Hg + O_2$

$2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$

$2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$

57 **(b)**
Mixture of calcium phosphate and calcium silicate is known as Thomas slag

58 **(d)**
Metals are good conductor of electricity because they contain free electrons

59 **(d)**
Purification of Hg, Sn and Bi involves liquation.

60 **(c)**
The abundance of elements in earth crust follow the order O > Si > Al > Fe .