DPP - Daily Practice Problems

Name : Date :

Start Time : End Time :

CHEMISTRY 38

SYLLABUS : Extraction of Metals -I : Occurence, Concentration, Roasting & Calcination

Max. Marks : 120 **Time : 60 min.**

GENERAL INSTRUCTIONS

- The Daily Practice Problem Sheet contains 30 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.
- You have to evaluate your Response Grids yourself with the help of solution booklet.
- Each correct answer will get you 4 marks and 1 mark shall be deduced for each incorrect answer. No mark will be given/ deducted if no bubble is filled. Keep a timer in front of you and stop immediately at the end of 60 min.
- The sheet follows a particular syllabus. Do not attempt the sheet before you have completed your preparation for that syllabus. Refer syllabus sheet in the starting of the book for the syllabus of all the DPP sheets.
- After completing the sheet check your answers with the solution booklet and complete the Result Grid. Finally spend time to analyse your performance and revise the areas which emerge out as weak in your evaluation.

DIRECTIONS (Q.1-Q.21) : There are 21 multiple choice questions. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE choice is correct.

Q.1 An example of halide ore is

(a) Galena (b) Bauxite

(c) Cinnabar (d) Cryolite

Q.2 Which of the following is not an ore?

(a) Bauxite

(b) Malachite

(c) Zinc blende

(d) Pigiron

Q.3 Cryolite is

(a) Magnesium silicate

(b) Sodium borofluoride

(c) Sodium aluminium fluoride

(d) Magnesium silicate

Q.4 Azurite is an ore of

(a) Ag (b) Cu

(c) Pt (d) Au

Q.5 Which ore contains both iron and copper?

(a) Cuprite (b) Chalcocite

(c) Chalcopyrite (d) Malachite

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ	5. ⓐⓑⓒⓓ

Space for Rough Work

Q.6 Chile saltpetre is

(a) $NaNO_3$ (b) KNO_3

(c) Na_2SO_4 (d) $Na_2S_2O_3$

Q.7 Which of the following is not an ore of magnesium?

(a) Magnesite (b) Dolomite

(c) Gypsum (d) Carnalite

Q.8 Which of the following is not a mineral of iron?

(a) Magnetite (b) Siderite

(c) Smithsonite (d) Limonite

Q.9 Indicate the mineral from which copper is manufactured?

(a) Galena (b) Cuprite

(c) Sphlerite (d) Chalcopyrite

Q.10 The most important ore of tin is

(a) Cassiterite (b) Cryolite

(c) Cerussite (d) None of these

Q.11 The substance added in water in the froth floatation process is

(a) soap powder (b) pine oil

(c) coconut oil (d) none of these

Q.12 Cyanide process is used in the extraction of

(a) Au (b) Ag

(c) both (a)and(b) (d) Cu

Q.13 Which of the following ore is best concentrated by froth floatation method?

(a) Galena

(b) Cassiterite

(c) Magnetite

(d) Malachite

Q.14 Main function of roasting is

(a) To remove volatile substances

(b) Oxidation

(c) Reduction

(d) Slag formation

Q.15 Which of the following statement is incorrect?

(a) Silver glance mainly contains silver sulphide

(b) Gold is found in native state

(c) Zinc blende mainly contain zinc chloride

(d) Copper pyrites also contain Fe_2S_3

Q.16 Which of the following processes does not involves calcination or roasting or dehydration?

(a) $ZnCO_3 \rightarrow ZnO + CO_2$

(b) $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$

(c) $2PbS + 3O_2 \rightarrow 2PbO + 2SO_2$

(d) $Al_2O_3.2H_2O \rightarrow Al_2O_3 + 2H_2O$

Q.17 Which of the following metal is obtained directly by roasting of its sulphide ore?

(a) Cu (b) Pb (c) Hg (d) Zn

Q.18 One of the ores of lead is known as lead pyromorphite. What is approximate composition ?

(a) $Pb_3O_4.PbCl_2$ (b) $PbSO_4.Pb(OH)_2$

(c) $3Pb_3(PO_4)_2.PbCl_2$ (d) $PbCO_3.Pb(OH)_2$

Q.19 Roasting involves

(a) Only volatilisation of volatile impurities

(b) Only volatilisation of volatile impurities and decomposition of the ore

(c) Volatilisation of volatile impurities and decomposition and oxidation of the ore

(d) Oxidation and reduction of the ore and slag formation

RESPONSE GRID					
	6. ⓐⓑⓒⓓ	7. ⓐⓑⓒⓓ	8. ⓐⓑⓒⓓ	9. ⓐⓑⓒⓓ	10. ⓐⓑⓒⓓ
	11. ⓐⓑⓒⓓ	12. ⓐⓑⓒⓓ	13. ⓐⓑⓒⓓ	14. ⓐⓑⓒⓓ	15. ⓐⓑⓒⓓ
	16. ⓐⓑⓒⓓ	17. ⓐⓑⓒⓓ	18. ⓐⓑⓒⓓ	19. ⓐⓑⓒⓓ	

Space for Rough Work

Q.20 The method of concentrating the ore which makes use of the difference in density between ore and impurities is called

(a) Levigation (b) Leaching

(c) Magnetic separation (d) Liquifaction

Q.21 Heating of ore in presence of air to remove sulphur impurities is called

(a) Calcination (b) Roasting

(c) Smelting (d) None of these

DIRECTIONS (Q.22-Q.24) : In the following questions, more than one of the answers given are correct. Select the correct answers and mark it according to the following codes:

Codes :

(a) 1, 2 and 3 are correct **(b)** 1 and 2 are correct

(c) 2 and 4 are correct **(d)** 1 and 3 are correct

Q.22 Which of the following are minerals of aluminium ?

(1) Diaspore (2) Bauxite

(3) Corundum (4) Anhydrite

Q.23 Choose the incorrect statement.

(1) Hydraulic washing is a method of ore dressing.

(2) Hydraulic washing is also known as levigation.

(3) Gravity separation is generally carried out by using Wilfley table.

(4) Gravity separation is generally not carried out by using hydraulic classifier.

Q.24 Which statements are incorrect?

(1) Gangues are carefully chosen to combine with the slag present in the ore to produce easily fusible flux to carry away the impurities.

(2) Slags are carefully chosen to combine with the flux present in the ore to produce easily fusible gangue to carry away the impurities.

(3) Gangues are carefully chosen to combine with the flux present in the ore to produce easily fusible slag to carry away the impurities.

(4) Fluxes are carefully chosen to combine with the gangue present in the ore to produce easily fusible slag to carry away the impurities.

DIRECTIONS (Q.25-Q.27) : Read the passage given below and answer the questions that follows :

Froth floatation process: In some cases, concentration of sulphide ores of copper, zinc and lead is brought by this method. This method is based on the preferential wetting of the ore by an oil. The finely grinded ore is taken in a tank containing water and 1% **of pine oil or terpentine oil.** A strong current of air is blown through the suspension, producing a heavy froth or foam on the surface. The metal sulphide is wetted by the oil but the gangues is not and the sulphide-oil mixture is carried to the surface by films of oil. The froth is skimmed off, the gangue settles down on the bottom or remains underneath the froth. By this floatation method it is possible to concentrate over 90% of a sulphide ore to 1/10 of its original bulk.

Q.25 Sulphide ores are generally concentrated by

(a) Froth floatation process

(b) Magnetic separation

(c) Gravity separation

(d) By hand picking

Q.26 For which ore of the metal, froth floatation method is used for concentration?

(a) Horn silver (b) Bauxite

(c) Cinnabar (d) Haematite

Q.27 Froth floatation process for the concentration of ores is an illustration of the practical application of

(a) Adsoption (b) Absorption

(c) Coagulation (d) Sedimentation

RESPONSE GRID					
	20. ⓐⓑⓒⓓ	21. ⓐⓑⓒⓓ	22. ⓐⓑⓒⓓ	23. ⓐⓑⓒⓓ	24. ⓐⓑⓒⓓ
	25. ⓐⓑⓒⓓ	26. ⓐⓑⓒⓓ	27. ⓐⓑⓒⓓ		

Space for Rough Work

DIRECTIONS (Q. 28-Q.30) : Each of these questions contains two statements: Statement-1 (Assertion) and Statement-2 (Reason). Each of these questions has four alternative choices, only one of which is the correct answer. You have to select the correct choice.

(a) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.

(b) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1.

(c) Statement -1 is False, Statement-2 is True.

(d) Statement -1 is True, Statement-2 is False.

Q.28 Statement-1: $Al(OH)_3$ is amphoteric in nature

Statement-2: Al-O and O-H bonds can be broken with equal ease in $Al(OH)_3$

Q.29 Statement-1: Coke and flux are used in smelting.

Statement-2: The phenomenon in which ore is mixed with suitable flux and coke and heated to fusion is known as smelting.

Q.30 Statement-1: Leaching is a process of reduction.

Statement-2: Leaching involves treatment of the ore with a suitable reagent so as to make it soluble while impurities remain insoluble.

RESPONSE GRID	28.ⓐⓑⓒⓓ	29.ⓐⓑⓒⓓ	30.ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM SHEET 38 - CHEMISTRY			
Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	44	Qualifying Score	64
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

Space for Rough Work

DAILY PRACTICE PROBLEMS

CHEMISTRY SOLUTIONS

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1. **(d)** Cryolite (Na_3AlF_6) Halide ore

   Galena (PbS), Cinnabar (HgS) } Sulphide ore

   Bauxite $Al_2O_3.2H_2O$ → Oxide ore

2. **(d)** Pig iron → It is the most impure form of iron and contains highest proportion of carbon (2.5 -4%)

   Malachite → $Cu(OH)_2.CuCO_3$

   Zinc blende → ZnS

   Bauxite → $Al_2O_3.2H_2O$

3. **(c)** Na_3AlF_6 Sodium hexafluoro aluminate (III)

4. **(b)** Azurite $Cu(OH)_2.2CuCO_3$

5. **(c)** Among cuprite [Cu_2O], Chalcocite [Cu_2S], Chalcopyrite [$CuFeS_2$] & Malachite [$Cu(OH)_2.CuCO_3$], only chalcopyrite is an ore which contains both Fe and Cu

6. **(a)** Chile salt petre is $NaNO_3$ while KNO_3 is Indian salt petre. Na_2SO_4 is Glauber salt and $Na_2S_2O_3$ is known as Hypo.

7. **(c)** Gypsum ($CaSO_4.2H_2O$) is an ore of calcium.

   Dolomite ($CaCO_3.MgCO_3$), Magnesite ($MgCO_3$) and Carnalite ($KCl.MgCl_2.6H_2O$) are the ores of Magnesium.

8. **(c)** Magnetite (Fe_3O_4), Siderite ($FeCO_3$), and Limonite ($Fe_2O_3.3H_2O$) are ores of Iron. Only Smithsonite is not an ore of Iron.

9. **(d)** Chalcopyrite ($CuFeS_2$)

10. **(a)** Cassiterite - SnO_2

    Cryolite - Na_3AlF_6

    Cerussite - $PbCO_3$

11. **(b)** Pine oil is foaming agent. Now another substance collector such as potassium ethyl xanthate or amyl xanthate are added.

12. **(c)** Cyanide process is used in the extraction of both Silver and Gold because these form complex salts with CN^- ions due to presence of lone pair of electrons on nitrogen atom.

13. **(a)** Here only Galena is PbS (a sulphide ore). Cassiterite is SnO_2 (oxide ore). Magnetite is Fe_3O_4 (Oxide ore) and Malachite is $Cu(OH)_2.CuCO_3$ (Carbonate ore). The froth floatation process is used to concentrate sulphide ores, based on preferential wetting properties with frothing agent and water.

14. **(a)** Main function of roasting is to remove volatile substances. For example

    $S_8 + 8O_2 \rightarrow 8SO_2 \uparrow$; $P_4 + 5O_2 \rightarrow P_4O_{10} \uparrow$

    $4As + 3O_2 \rightarrow 2As_2O_3 \uparrow$

15. **(c)** Zinc blende is ZnS not $ZnCl_2$

16. **(b)** Reduction with carbon is called smelting

    $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$

17. **(c)** When conc. HgS ore is roasted

    $HgS + O_2 \xrightarrow{773-873K} Hg + SO_2$

    At this temperature, mercury vaporises and the vapours are condensed to the liquid metal. Mercury so obtained is about 99.7% pure.

18. **(c)** **Lead pyromorphite** is a phosphate ore. It can be represented as $3Pb_3(PO_4)_2.PbCl_2$.

19. **(c)**

20. **(a)**

21. **(b)** Roasting involves heating of the ore either alone or with some other material usually in presence of air below its fusion temperature. In roasting, definite chemical changes like oxidation, chlorination etc., take place

    $S + O_2 \rightarrow SO_2$

22. **(a)** Bauxite ($Al_2O_3.2H_2O$)

    Corundum (Al_2O_3)

    Diaspore ($Al_2O_3.H_2O$)

23. **(c)** Hydraulic classifier is generally used to carry out gravity separation.

24. **(a)** Statement (4) is the only correct statement. Thus (1), (2) and (3) are incorrect statements. Flux is specifically taken, to produce, fusible slag which carry away impurities with it.

25. **(a)** Froth floatation method is based on the fact that the surface of sulphide ores is preferentially wetted by oil while that of gangue is wetted by water.

26. **(c)** Cinnabar (HgS) the ore of mercury is concentrated by froth floatation process.

27. **(a)** Froth floatation process is the practical application of adsorption.

28. **(d)** Statement-1 is True, Statement-2 is False. $Al(OH)_3$ can react with acid as well as alkalies. Al-O bond is carrying some covalent character whereas O–H bond is ionic and have different bond energy.

29. **(b)** Both assertion and reason are true but reason is not the correct explanation of assertion. Non-fusible mass present in ore mixing with suitable flux are fused which are then reduced by coke to give free metal.

30. **(c)** Assertion is false but reason is true. Leaching is a process of concentration.