DPP - Daily Practice Problems

Name : _____ Date : _____

Start Time : _____ End Time : _____

CHEMISTRY 46

SYLLABUS : Haloalkanes & Haloarenes - I : Introduction and Preparation of Halogen Containing Compounds

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.24) : There are 24 multiple choice questions. Each question has 4 choices (a), (b), (c) and (d), out of which ONLY ONE choice is correct.

Q.1 Which of the following is a secondary halide ?

(a) Isopropyl chloride

(b) Isobutyl chloride

(c) *n*-Propyl chloride

(d) *n*-Butyl chloride

Q.2 Haloforms are trihalogen derivatives of

(a) ethane (b) methane

(c) propane (d) benzene

Q.3 The compound which contains all the four 1°, 2°, 3° and 4° carbon atoms is

(a) 2, 3-dimethylpentane

(b) 3-chloro-2, 3-dimethylpentane

(c) 2, 3, 4-trimethylpentane

(d) 3, 3-dimethylpentane

Q.4 What is the main product of the reaction between 2-methylpropene with HBr ?

(a) 1-Bromobutane

(b) 1-Bromo- 2-methylpropane

(c) 2-Bromobutane

(d) 2-Bromo-2-methylpropane

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

Space for Rough Work

Q.5 When ethyl alcohol (C_2H_5OH) reacts with thionyl chloride, in the presence of pyridine, the product obtained is

(a) $CH_3CH_2Cl + HCl$

(b) $C_2H_5Cl + Cl_2 + SO_2$

(c) $CH_3CH_2Cl + H_2O + SO_2$

(d) $CH_3CH_2Cl + HCl + SO_2$

Q.6 In methyl alcohol solution, bromine reacts with ethylene to yield $BrCH_2CH_2OCH_3$ in addition to 1, 2-dibromoethane because

(a) the ion formed initially may react with Br^- or CH_3OH

(b) the methyl alcohol solvates the bromine

(c) the reaction follows Markownikoff's rule

(d) this is a free-radical mechanism

Q.7 $C_3H_8 + Cl_2 \xrightarrow{Light} C_3H_7Cl + HCl$ is an example of which of the following types of reactions ?

(a) Substitution (b) Elimination

(c) Addition (d) Rearrangement

Q.8 Benzene reacts with chlorine to form benzene hexachloride in presence of which of the following agent?

(a) Nickel (b) $AlCl_3$

(c) Bright sunlight (d) Zinc

Q.9 When ethyl alcohol and KI react in presence of Na_2CO_3, yellow crystals of ..... are formed.

(a) CHI_3 (b) CH_3I (c) CH_2I_3 (d) C_2H_5I

Q.10 Which one of the following processes does not occur during formation of $CHCl_3$ from C_2H_5OH and bleaching powder?

(a) Hydrolysis (b) Oxidation

(c) Reduction (d) Chlorination

Q.11 C_6H_5Cl is prepared by reacting aniline with

(a) HCl

(b) Cu_2Cl_2

(c) Cl_2 in presence of anhydrous $AlCl_3$

(d) HNO_2 and then heated with Cu_2Cl_2

Q.12 A Grignard's reagent may be made by reacting magnesium with

(a) methyl amine (b) diethyl ether

(c) ethyl iodide (d) ethyl alcohol

Q.13 Best method of preparing alkyl chloride is

(a) $ROH + SOCl_2 \longrightarrow$

(b) $ROH + PCl_5 \longrightarrow$

(c) $ROH + PCl_3 \longrightarrow$

(d) $ROH + HCl \xrightarrow{\text{Anhydrous } ZnCl_2}$

Q.14 DDT is prepared by reacting chlorobenzene with

(a) CCl_4 (b) CCl_3-CHO

(c) $CHCl_3$ (d) Ethane

Q.15 Preparation of alkyl halides in laboratory is least preferred by

(a) treatment of alcohols

(b) addition of hydrogen halides to alkenes

(c) halide exchange

(d) direct halogenation of alkanes

Q.16 Which of the following acids adds to propene in the presence of peroxide to give anti-Markownikoff's product?

(a) HF (b) HCl

(c) HBr (d) HI

Q.17 Conart Finkelstein reaction for the preparation of alkyl iodide is based upon the fact that

(a) Sodium iodide is soluble in methanol, while sodium chloride is insoluble in methanol

(b) Sodium iodide is soluble in methanol, while NaCl and NaBr are insoluble in methanol

(c) Sodium iodide is insoluble in methanol, while NaCl and NaBr are soluble

(d) The three halogens differ considerably in their electronegativity

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

Space for Rough Work

Q.18 $R-OH+HX \rightarrow R-X+H_2O$

In the above reaction, the reactivity of different alcohols is

(a) Tertiary > Secondary > Primary

(b) Tertiary < Secondary < Primary

(c) Tertiary < Secondary > Primary

(d) Secondary < Primary < Tertiary

Q.19 $C_6H_6+Cl_2 \xrightarrow{\text{UV Light}} \text{Product.}$

In above reaction, product is

(a) CCl_3CHO (b) $C_6H_6Cl_6$

(c) $C_6H_{12}Cl_6$ (d) $C_6H_9Cl_2$

Q.20 Ethanol is converted into ethyl chloride by reacting with which of the following?

(a) Cl_2 (b) $SOCl_2$

(c) HCl (d) NaCl

Q.21 Ethyl benzoate reacts with PCl_5 to give

(a) $C_2H_5Cl+C_6H_5COCl+POCl_3+HCl$

(b) $C_2H_5Cl+C_6H_5COCl+POCl_3$

(c) $CH_3COCl+C_6H_5COCl+POCl_3$

(d) $C_2H_5Cl+C_6H_5COOH+POCl_3$

Q.22 In presence of $AlCl_3$, benzene and *n*-propyl bromide react in Friedel-Craft's reaction to form

(a) *n*-propylbenzene

(b) 1, 2-dinormal propylbenzene

(c) 1, 4-dinormal propylbenzene

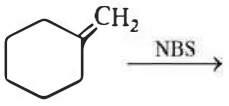
(d) Isopropylbenzene

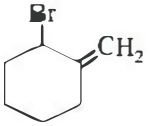
Q.23 The catalyst used in Raschig's process is

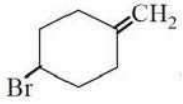
(a) $LiAlH_4$ (b) Copper chloride

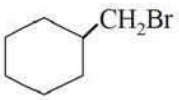
(c) Sunlight (d) Ethanol/Na

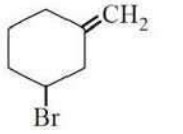
Q.24 What will be the product in the following reaction?



(a) 

(b) 

(c) 

(d) 

DIRECTIONS (Q.25-Q.27) : 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.25 Which of the following is not a primary halide?

(1) Isopropyl iodide

(2) Secondary butyl iodide

(3) Tertiarybutyl bromide

(4) Neohexyl chloride

Q.26 Chloroform can not be obtained from

(1) Methanol (2) Methanal

(3) Propanol-1 (4) Propanol-2

Q.27 Which of the following compounds undergo nucleophilic substitution reactions?

(1) Isopropyl chloride (2) Ethyl bromide

(3) Benzyl chloride (4) Vinyl chloride

RESPONSE GRID					
	18. ⓐ ⓑ ⓒ ⓓ	19. ⓐ ⓑ ⓒ ⓓ	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: $CHCl_3$ is stored in dark bottles.

Statement-2: $CHCl_3$ is oxidised in dark.

Q.29 Statement-1: CCl_4 is not a fire extinguisher.

Statement-2: CCl_4 is insoluble in water.

Q30 Statement-1 :  is less reactive than 

towards S_N1 reactions.

Statement-2: Tertiary alkyl halides react predominantly by S_N1 mechanism.

RESPONSE GRID	28.ⓐⓑⓒⓓ	29.ⓐⓑⓒⓓ	30.ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM SHEET 46 - CHEMISTRY			
Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	36	Qualifying Score	56
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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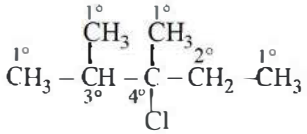
1. **(a)** In isopropyl chloride $\left(CH_3-\overset{2^\bullet}{\underset{Cl}{\underset{|}{CH}}}-CH_3\right)$, chlorine atom is attached to 2° carbon atom.

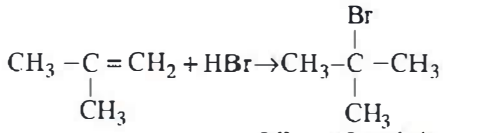
2. **(b)** $CH_4 \xrightarrow[+3X]{-3H} CHX_3\,(X = Cl, Br, I)$

3. **(b)**



3–Chloro–2,3-dimethylpentane

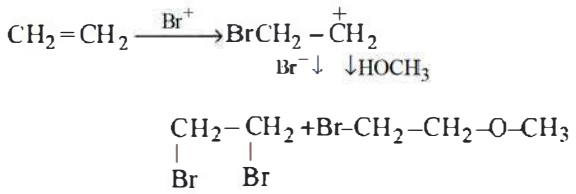
4. **(d)**



2-Bromo- 2- methylpropane

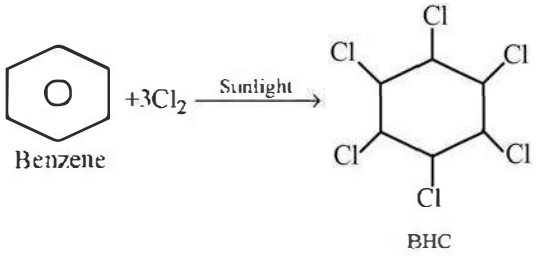
5. **(d)** $C_2H_5OH + SOCl_2 \xrightarrow{\text{Pyridine}} C_2H_5Cl + SO_2 + HCl$

6. **(a)**



7. **(a)** $C_3H_8 + Cl_2 \xrightarrow{\text{Light}} C_3H_7Cl + HCl$

8. **(c)**



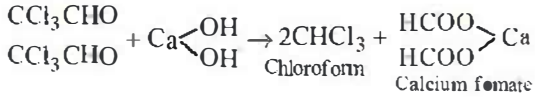
Benzene BHC

9. **(a)** $C_2H_5OH \xrightarrow[Na_2CO_3]{KI} CHI_3$ (Haloform reaction)

10. **(c)** $CaOCl_2 + H_2O \xrightarrow{\text{Hydrolysis}} Ca(OH)_2 + Cl_2$

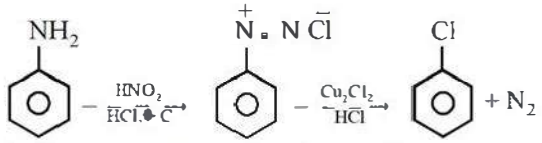
$CH_3CH_2OH + Cl_2 \xrightarrow{\text{Oxidation}} CH_3CHO + 2HCl$

$CH_3CHO + 3Cl_2 \xrightarrow{\text{Chlorination}} CCl_3CHO + 3HCl$



Chloroform Calcium formate

11. **(d)**



Aniline Benzene diazonium chloride Chlorobenzene

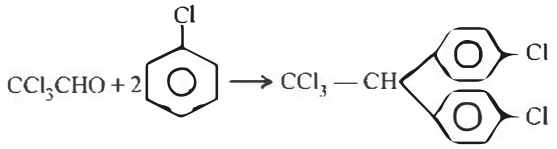
12. **(c)** $C_2H_5I + Mg \xrightarrow{\text{Dry ether}} C_2H_5-Mg-I$

Ethyl iodide Ethyl magnesium iodide

13. **(a)** In this method, all other products are gases and thus escape, forming alkyl halide in pure state .

$R-OH + SOCl_2 \xrightarrow{\Delta} R-Cl + HCl\uparrow + SO_2\uparrow$

14. **(b)**



15. **(d)** Direct halogenation of alkanes is least preferred for preparing RX because di-, tri- and tetra- halogenated products are also formed.

16. **(c)** HBr

17. **(b)** $R-X + NaI \xrightarrow{\text{acetone}} R-I + NaX\downarrow$

Soluble in (CH_3OH, Me_2CO) Insoluble in (CH_3OH, Me_2CO)

(where X = Cl or Br)

18. **(a)**

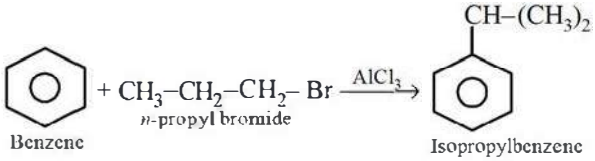
19. **(b)** $C_6H_6 + 3Cl_2 \xrightarrow{\text{U.V light}} C_6H_6Cl_6$

Benzene BHC

20. **(b)** $C_2H_5OH + SOCl_2 \xrightarrow{\text{Pyridine}} C_2H_5Cl + SO_2 + HCl$

21. **(b)** $C_6H_5COOC_2H_5 + PCl_5 \longrightarrow C_6H_5COCl + C_2H_5Cl + POCl_3$

22. **(d)**



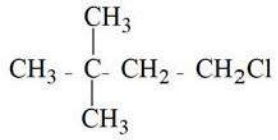
Benzene *n*-propyl bromide Isopropylbenzene

The intermediate $CH_3\overset{+}{C}H_2CH_2$ rearranges to the more stable $(CH_3)_2\overset{+}{C}H$.

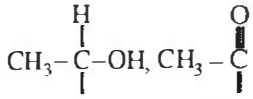
23. **(b)**

24. **(a)** NBS is a selective brominating reagent since it normally brominates the ethylenic compounds in the allylic position.

25. **(a)** Neohexyl chloride is a primary halide as in it Cl- atom is attached to a primary carbon.



Thus (1), (2) and (3) are correct choices.

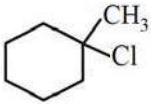
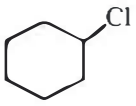
26. **(a)** Only those compounds can form chloroform which have  type structure. Of the given choices, propanol - 2 is the only compound having the required structure.

Thus (1), (2) and (3) are correct choices

27. **(a)** As a result of resonance, the carbon-chlorine bond in vinyl chloride acquires some double bond character. Hence, vinyl chloride does not undergo nucleophilic substitution reactions.

28. **(d)** $CHCl_3$ is stored in dark bottles to prevent oxidation of $CHCl_3$ is presence of sunlight.

29. **(c)** CCl_4 is used as a fire extinguisher. The dense, non combustible vapours cover the burning substance and prevents the availability of oxygen around burning material.

30. **(c)**  is more reactive than  because the former is a tertiary alkyl halide and the latter is a secondary alkyl halide. Tertiary alkyl halides react predominantly by S_N1 mechanism.