**KIIT WORLD SCHOOL**

**ASSIGNMENT**

**CLASS 12 CHEMISTRY**

**UNIT 10: Haloalkanes and Haloarenes**

**KNOWLEDGE BASED**

**Q1. Describe the following name reactions with equations:**

1. **Wurtz reaction**
2. **Friedel-crafts reaction**
3. **Wurtz-Fittig reaction**
4. **Fittig reaction**
5. **Carbylamine reaction**
6. **Sandmayer’s reaction**
7. **Finkelstein reaction**
8. **Swarts reaction**

**Q2. What is Saytzeff rule? Illustrate with suitable example.**

**Q3. Draw the four resonating structures of halobenzene.**

**Q4. Although chlorine is an EWG, yet it is ortho para directing in electrophilic aromatic substitution reactions. Why? Show with the help of the structures**

**UNDERSTANDING BASED**

**Q5. Write the IUPAC name for the following compounds:**

1. **CH3CF(C2H5)CH2C(Cl,C2H5)CH3**
2. **CH3C(C2H5, NO2)CH2C(I, C2H5)CH3**
3. **CH2(Cl)C=CCH2(Br)**
4. **CH3CH=CHCH2(Br)**
5. **CH3C(CH3)=C(Br)CH2OH**
6. **CH2=C(CH3)CH2(Br)**

**Q6. Write the structure of the following organic compounds:**

1. **2-chloro-3-methylpentane**
2. **3-methylbutanal**
3. **2-chloro-2,3-dimethylpentane**
4. **1-chloro-2-methylpropane**
5. **3-chloro-5-fluoro-3,5-dimethylheptane**
6. **2-chloro-3-ethylpenta-1,4-diene**

**Q7. SN2 reaction leads to inversion of configuration. Describe the reaction mechanism leading to the inverted product.**

**Q8. SN1 reaction follows first order kinetics. Show that how the rate of the reaction depends upon the concentration of only one reactant i.e. tert-butyl bromide.**

**Q9. Reactivity of haloarenes increases due to the presence of electron withdrawing group at ortho and para positions. Outline the reaction mechanism for this and give reasons for such effect.**

**Q10. Out of ethyl bromide and ethyl chloride which has higher boiling point and why?**

**Q11. Why are haloalkanes more reactive towards nucleophilic substitution reaction than haloarenes?**

**Q12. Which one of the following reacts faster in an SN1 reaction and why?**

**CH3CH2CH(Cl)CH2CH3  OR CH3CH2CH2CH2CH2(Cl)**

**Q13. Suggest a possible reason for the following observations:**

1. **The order of reactivity of haloalkanes is RI>RBr>RCl**
2. **Neopentyl chloride (CH3)3CCH2Cl does not follow SN2 mechanism.**
3. **Ethers have low boiling points.**
4. **Haloalkanes easily dissolve in organic solvents. Why?**
5. **Of the two bromo derivatives, C6H5CH(CH3)Br and C6H5CH(C6H5)Br, which one is more reactive in SN1 reaction and why?**

**APPLICATION/SKILL**

**Q14. How will you distinguish between para-dichlorobenzene and ortho-dichlorobenzene on the basis of its melting point? What is the reason for such kind of behaviour?**

**Q15. Distinguish between the following pairs:**

1. **Monochromatic light and plane polarised light**
2. **Stereocentre and symmetric carbon**
3. **Chiral and achiral molecules**
4. **Inversion and retention**
5. **SN1 and SN2 mechanisms**
6. **Elimination and substitution reaction**

**Q16. Suggest a mechanism for the reaction:**

**n-BuBr + KCN C2H5OH, water  n-Bu CN**

**Q17. Rearrange the compounds of each of the following sets in order of reactivity towards SN2 displacement:**

1. **2-bromo-2-methylbutane, 1-bromopentane, 2-bromopentane**
2. **1-bromo-3-methylbutane, 2-bromo-2-methylbutane, 2-bromo-3-methylbutane**
3. **1-bromobutane, 1-bromo-2,2-dimethylpropane, 1-bromo-2-methylbutane, 1-bromo-3-methylbutane**

**Q18. How are the following conversions done:**

1. **But-1-ene into 1-chlorobutane**
2. **Benzene to bromobenzene**
3. **1-chloropropane to propan-1-ol**
4. **2-methylpent-1-ene to 2-methylpentan-2-ol**
5. **Ethene to ethanol**
6. **1-iodopropane to propene**
7. **Bromomethane to methyl magnesium bromide**
8. **Chlorobenzene to phenol**
9. **Phenol to phenyl ethanoate**

**Q19. Nitration of chlorobenzene is difficult than benzene although chlorine is o- and p-directing. Why?**

**Q20. What is the effect of resonance on the dipole moment of vinyl chloride?**

**Q21. Chloroform does not give any precipitate with silver nitrate solution. Give reason.**

**HOTS**

**Q22. An alkyl chloride (A) , on reaction with Mg in dry ether followed by treatment with ethanol gave 2-methybutane. Write all the possible structures of A.**

**Q23. An alkyl halide , X, of formula C6H13Cl on treatment with potassium tertiary butoxide gives two isomeric alkenes Y and Z (C6H12). Both the alkenes on hydrogenation give 2,3-dimethylbutane. Predict the structures of X, Y and Z.**

**Q24. Give a chemical test to distinguish between the following:**

1. **Chlorobenzene and benzyl chloride**
2. **Chloroform and dichloromethane**

**Q25. It is difficult to replace chlorine from chlorobenzene. Why?**

**VBQ**

**Q26. Gita regularly cleans her artist father’s metal table with an organic liquid given by her father. After some time, she started having irritation in her eyes. After few months she eventually lost vision in one of her eyes.**

**i) name the organic compound.**

**ii) What is the effect of chlorine on methane in presence of light?**

**iii) Why did Gita lost her vision?**

**ATTEMPT ALL INTEXT AND BACK EXERCISE QUESTIONS OF NCERT**