

12. Ethers

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Introduction

1. Write the structure of Anisole. 1
2. What is the functional group of an ether? 1
3. Write the IUPAC name of $\text{CH}_3\text{-O-CH(CH}_3\text{)}_2$ 1
Write the structure of 2-methoxypropane. 1
4. What is an unsymmetrical ether? Write an example with the IUPAC name. 2
5. Write the IUPAC names of ethers represented by the molecular formula $\text{C}_5\text{H}_{12}\text{O}$. 2
6. Write down the isomeric ether of Isopropyl alcohol. 1
7. There are three possible isomeric ethers of $\text{C}_4\text{H}_{10}\text{O}$. One of them is Ethoxyethane. Write the other two isomers and give their IUPAC name. 2
Write down the possible unsymmetrical ethers of $\text{C}_4\text{H}_{10}\text{O}$ and give their IUPAC names. 2
8. Write the unsymmetrical ether of $\text{C}_3\text{H}_8\text{O}$. 1

Preparations

1. From Halolakanes (Williamson's etherification process)
 2. Preparation of Methoxybenzene (Anisole) By Williamson's synthesis
9. What happens when Sodium phenoxide (**Sodium phenolate**) reacts with Iodomethane? 1
Give the correct chemical reaction for the preparation of anisole. 1
Prepare $\text{C}_6\text{H}_5\text{-O-CH}_3$ using Williamson's ether synthesis. 1
Starting from CH_3Cl , how would you prepare Methoxybenzene? 1
 10. Name the compounds X and Y in the following reaction
$$\text{C}_6\text{H}_5\text{-OH} \xrightarrow{\text{Na}} \text{X} \xrightarrow{\text{CH}_3\text{I}} \text{Y}$$

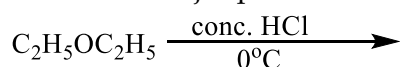
How is Methoxybenzene prepared from phenol? 1
Starting from Phenol, how would you prepare Methoxybenzene? 2
How would you obtain anisole from phenol? 1
 11. Starting from CH_3ONa , how would you prepare Methoxybenzene? 1

Physical Properties

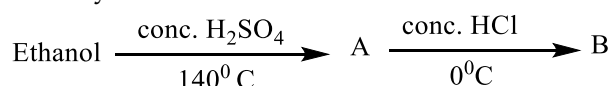
Chemical Properties

[A] Reaction due to ethereal oxygen

1. Action with cold conc. HCl and H_2SO_4 (formation of oxonium salt)
12. Predict the major product for the following reaction:



13. Identify A and B in



2. Action with Conc. H₂SO₄

14. What happens when Ethoxyethane is heated with conc. H₂SO₄? 1

[B] Reaction involving cleavage of C-O bond

3. Action with HI

15. Name the isomer of C₂H₆O which reacts with excess HI, gives Iodomethane as the major product and write the reaction for it. 2
16. What is the action of Ethoxyethane on aq. HI? 1
What product is obtained when ethoxyethane is heated with excess HI?
17. Write down an isomeric ether of isopropyl alcohol. What happens when the isomeric ether is heated with excess HI? 2
18. What happens when Methoxybenzene is heated with excess HI? 1

[C] Reactions involving alkyl group

3. Action with Air

19. What happens when Ethoxyethane with heated with air? 1
20. Write the chemical reaction when Ethoxyethane is exposed to light and air. 1
What happens when Ethoxyethane is exposed to air? 1
21. Give reason: It is dangerous to boil samples of ethers stored for a long time. 1
Why are old samples of ether not distilled to dryness in the air? 1
22. Give reason: Ether is stored in a bottle containing an iron wire. 1

4. Action with Cl₂

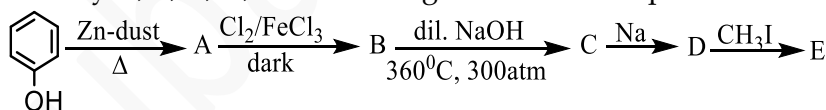
Conversions

23. How is Ethoxyethane converted to Methoxymethane? 1
24. Convert Ethoxyethane to Methoxyethane. 2
25. How would you obtain Methoxymethane from Ethanol? 1
26. Identify major products A and B, giving their IUPAC names in the given reaction sequence.



2

27. Identify A, B, C, D, and E in the given reaction sequence with their IUPAC names.



28. A set of organic compounds is given. Arrange the given compounds in a regular sequence with correct use of catalysts, reagents or conditions so that one compound is formed from another.
C₂H₅OC₂H₅, CH₃OCH₃, CH₃CH₂I, CH₃CH₂OH, CH₃CH₂NH₂

29. Convert phenol into anisole. 2

Uses of Ethoxyethane

Uses of Anisole