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- 1 Give the IUPAC name of the following.
  - a  $\text{CH}_3\text{OCH}_3$  - Methoxymethane
  - b  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxyethane
  - c  $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O}$  -
  - d  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$  - Ethoxypropane
  - e  $\text{CH}_3\text{CH}_2\text{OCH}_3$  - Methoxyethane
  
- 2 Discuss properties of Ethers
  - a An ether molecule has net dipole because of the polarity of C-O bond.
  
  - b The boiling of ethers is comparable to the alkane and much lower than that of alcohol of comparable molecular mass despite the polarity of C-O bond. The miscibility of ethers with water is comparable to that of alcohols.
  
  - c Ether molecules are miscible in water. This is due to the fact that its oxygen molecules can form hydrogen bonds with a water molecules

### Chemical properties

C-O bond

- Cleavage of ether ~~molecules~~: Ethers are generally unreactive but an excess of hydrogen halide is added to it, cleavage of C-O bond occurs and it forms alkyl halide



- Electrophilic substitution: The alkoxy group in ethers activates ~~an~~ in the ortho or para position of electrophilic substitution.
- Halogenation of ethers - Aromatic ethers undergo halogenation for example, bromination, upon addition of halogen in the presence or absence of a catalyst.
- Friedel craft's reaction of ethers: Aromatic ethers undergo Friedel craft's reaction. For example addition of alkyl or acyl ~~group~~ halide in the presence of a Lewis acid as catalyst.

### 3 Method of preparation of ethers

- Dehydration of alcohols: In the presence of sulphuric acid, dehydration of ethanol yields ethoxyethane at 413K. This is an ideal method of preparation through primary alcohol. This method is nucleophilic.



- Williamson's synthesis: When an alkyl halide reacts with sodium alkoxide, ether is formed.



### 4 State 4 uses of ethylene oxide

- It is used as an intermediate in the production of several industrial chemicals.
- It is used as a fumigant in certain agricultural products.
- It is used as a sterilant for medical equipment and supplies.