Name: Ogudugu Eromosele Peter

Deapartment: Petroleum engineering

Matric no: 19/Eng07/014

Physical Properties of Ethers

1An ether molecule has a net dipole moment due to the polarity of C-O bonds.

2The boiling point of ethers is comparable to the alkanes but much lower than that of alcohols of comparable molecular mass despite the polarity of the C-O bond. The miscibility of ethers with water resembles those of alcohols.

3Ether molecules are miscible in water. This is attributed to the fact that like alcohol, the oxygen atom of ether can also form hydrogen bonds with a water molecule.

: Chemical Properties of ethers

1. Cleavage of C-O bond

Ethers are generally very unreactive in nature. When an excess of hydrogen halide is added to the ether, cleavage of C-O bond takes place leading to the formation of alkyl halides. The order of reactivity is given as HI>HBr>HCl

R-O-R + HX → RX + R-OH

2. Electrophilic Substitution

The alkoxy group in ether activates the aromatic ring at ortho and para positions for electrophilic substitution. Common electrophilic substitution reactions are halogenation, Friedel Craft's reaction etc.

3. Halogenation of Ethers

Aromatic ethers undergo halogenation, for example, bromination, upon the addition halogen in the presence or absence of a catalyst.

4. Friedel Craft's Reaction of Ethers

Aromatic ethers undergo Friedel Craft's reaction for example addition of alkyl or acyl group upon the reaction with alkyl or acyl halide in the presence of a Lewis acid as Methods of preparing ethers

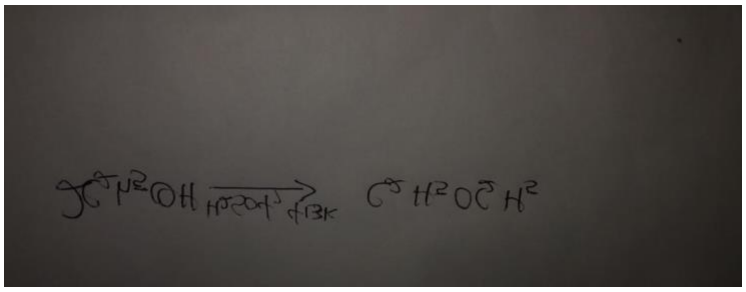
Ethers can be prepared from other organic compounds by numerous methods.

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

Dehydration of alcohols reaction

Williamson's synthesis: When an alkyl halide reacts with sodium alkoxide, ether is formed. This reaction is known as Williamson's synthesis. The reaction generally follows the SN2 mechanism for primary alcohols.

EthersFor



For Williams synthesis

Fig: Williamson's synthesis