

Kantees - Loree Joan Ayobaficlafe

19/MTDOR/069

Nursing

Chemistry.

1. Give the IUPAC names of the following organic compounds

a) CH_3OCH_3 - methoxy methane

b) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane

c) $(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{O} \rightarrow$ Butoxy methane

d) $\text{CH}_3\text{CH}_2\text{OCH}_3$ - methoxy ethane

e) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane

2. Discuss the properties of ethers

a) Physical properties of ethers.

i) An ether molecule has a net dipole moment we can attribute to the polarity of C-O bond.

ii) The boiling points of ethers is comparable to the alkanes. However it is much lower compared to that of alcohols of comparable molecular mass despite the polarity of the C-O bond.

b) Ether molecules are miscible in water we can attribute this to the fact that like alcohols the oxygen atom of ethers can also ^{form} hydrogen bonds with a water molecule.

c) The miscibility of ethers with water resembles those of alcohols.

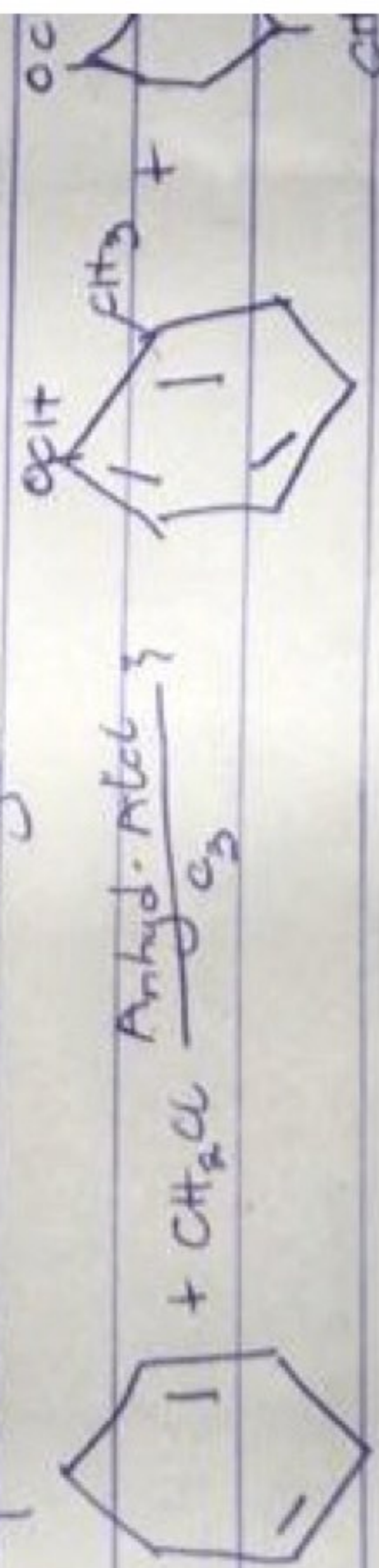
Chemistry preparation of ethers

Halogenation of ethers: Aromatic ethers undergo halogenation (simple bromination) upon the addition of halogen in the presence of catalyst.

Electrophilic substitution: The alkoxy group in ether acts as a directing group in aromatic ring at ortho and para positions for electrophilic substitution reactions. Common electrophilic substitution reactions include nitration, sulfonation, halogenation, etc.

Friedel-Crafts Reaction of ethers

Aromatic ethers undergo Friedel-Crafts alkylation reaction for example anisole or alkyl group upon the reaction with alkyl or aryl halide in the presence of Lewis acid as catalyst.

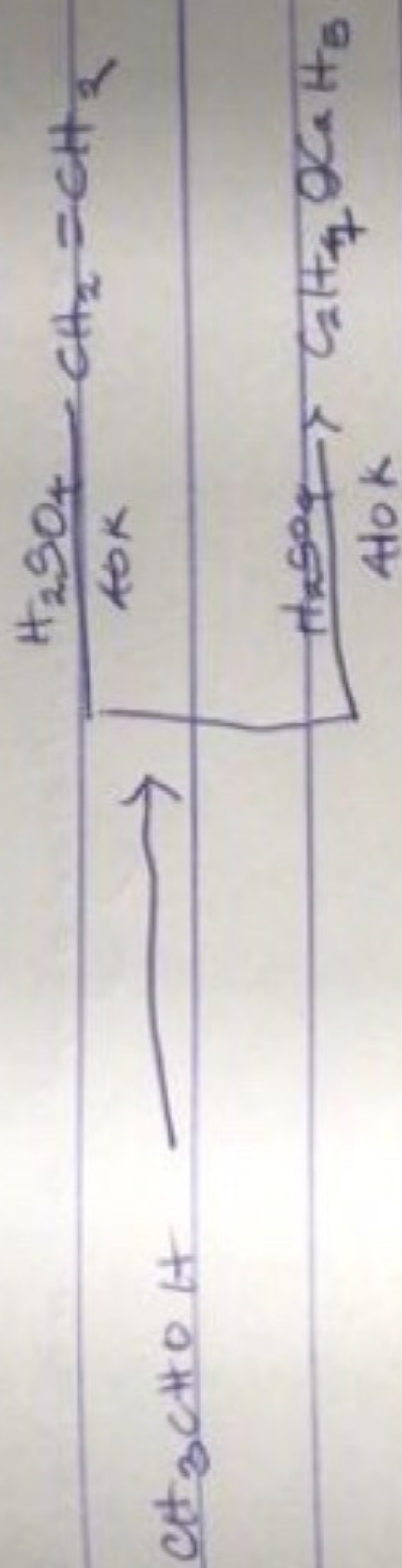


Cleavage of C-O bonds → Ethers are generally very inert to cleavage where an excess of hydrogen halide is added to the ether. C-O bond breaks preferentially leading to the formation of alkyl halide and alcohol. Order of reactivity: $HI > HBr > HCl$

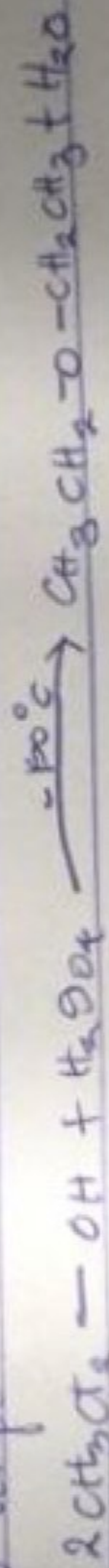
1. Discuss explicitly two methods of preparing ether and show equations of reaction.

1) Partial dehydration of alcohols

In the presence of protic acids (sulphuric acid), alcohols undergo dehydration to produce alkenes and ethers under different conditions. In this, simple ethers are manufactured from alcohols by catalytic dehydration. The alcohol in excess and concentrated temperature at 140°C is known as continuous ethenification.



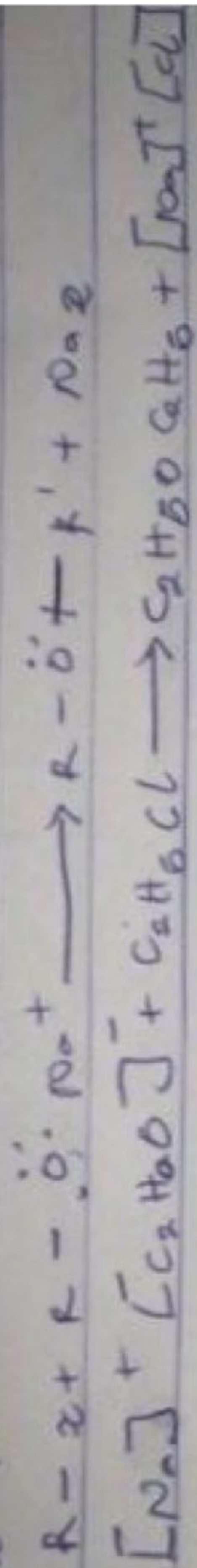
At temperature 110° to 130°



2) Williamson Synthesis

The important method for producing ethers in the lab in the mol we carry out a reaction of an alkyl halide with sodium alkoxide which leads to the formation of ether. Alkoxides are strong bases they can react with alkyl halide. Basically alkoxide ion is displaced from an alkyl halide by an alkoxide ion.

Example.



- 1) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.
- 2) Ethylene oxide is used in the preparation of non-ionic emulsifying agents, plastics etc.
- 3) It is used as a gaseous sterilizing agent for medical equipment.