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DEPARTMENT: MBBS

COLLEGE OF MEDICINE AND HEALTH SCIENCES.

COURSE CODE: CHM 102

Assignment.

① Give the IUPAC names of the following organic compounds.

CH_3OCH_3 - Methoxymethane.

$\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxyethane.

$(\text{C}_2\text{H}_5)_2\text{O}$ - Pentanamide.

$\text{CH}_3\text{CH}_2\text{OCH}_3$ - Methoxyethane.

$\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$ - Ethoxypropane.

2) Discuss the properties of ethers

Physical Properties of ethers.

a) An ether molecule has a net dipole moment. We can attribute this to the polarity of C-O bonds.

b) The boiling point of ethers is comparable to the alkanes.

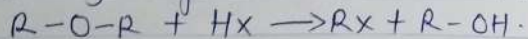
c) The miscibility of ethers with water resembles those of alcohols.

d) Ether molecules are miscible in water.

Chemical Properties of ethers.

a) 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 $\text{HI} > \text{HBr} > \text{HCl}$.



b) 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.

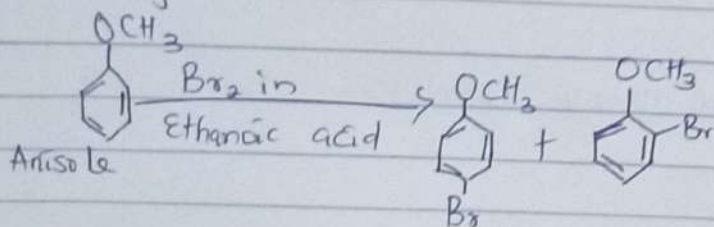
c) Halogenation of Ethers: Aromatic ethers undergo halogenation. For example, bromination, upon the addition of halogen in the presence or absence

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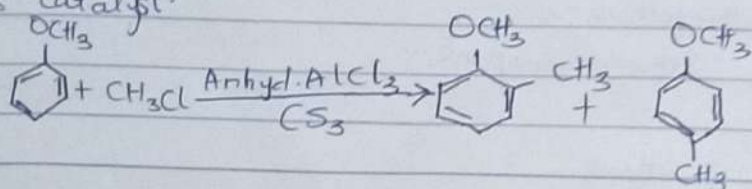
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of a catalyst.

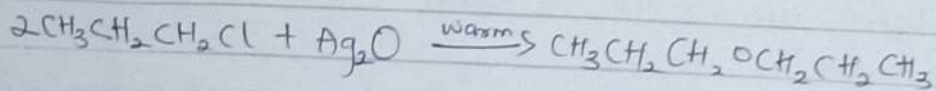
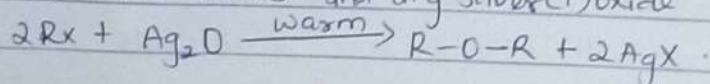


4) Friedel Craft's Reaction of Ethers: Aromatic ethers undergo Friedel Craft's reaction for example addition of alkyl or acyl group upon the reaction with alkyl or acyl halide in the presence of a Lewis acid as catalyst.

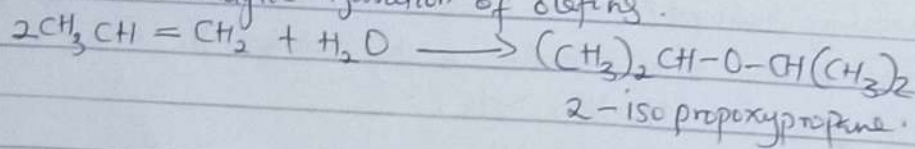


3) Discuss explicitly two methods of preparing ethers and show equations of reaction.

a) From haloalkanes and dry silver(I) oxide



b) Controlled catalytic hydration of olefins.



4) State three uses of ethylene oxide.

a) Ethylene oxide is used as a gaseous sterilizing agent.

b) Ethylene oxide is used in the preparation of nonionic emulsifying agents, plastics, plasticizers and several synthetic textiles.

c) Ethylene oxide is used as an intermediate in the hydrolytic manufacture of ethylene glycol.