

M. Sc. Sem. IV
E.C. - IC
Organic Chemistry Special
Topic: Terpenoids
Unit-1: Camphor;
- Dr. Manjun Kumar

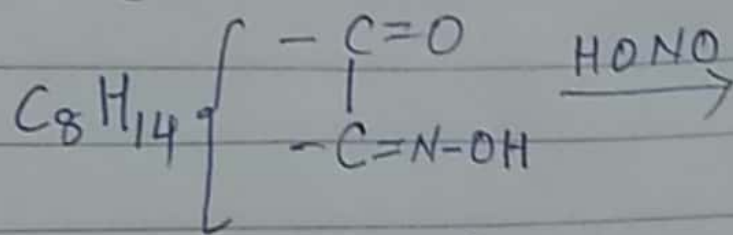
Qn. Discuss the chemical constitution of Camphor. Describe the methods of synthesis of Camphor.
Or, Discuss evidences in support of the accepted structure of Camphor.

Ans. Structure of Camphor:
1. Its mol. formula is $C_{10}H_{16}O$.
2. The nature of O-atom is found to be cyclic ketonic by the fact that camphor forms an oxime with NH_2OH , semicarbazone with semi-carbazide and a dicarboxylic acid having the same number of C-atom on oxidation.

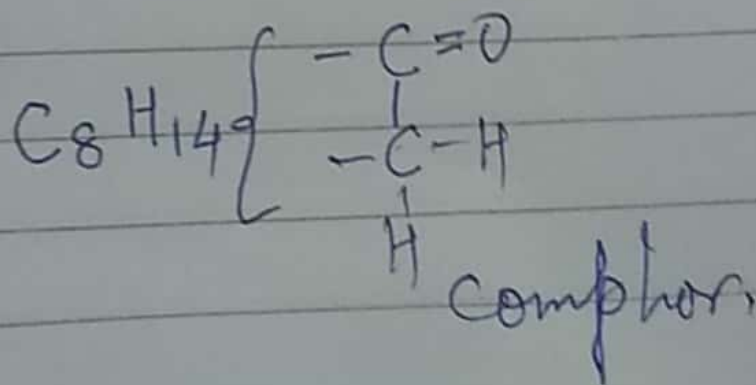
(2)

3. The presence of $>C=O$ group in camphor led as $C_{10}H_{18}$ as the mol. formula of its saturated hydrocarbon. Since $C_{10}H_{18}$ corresponds to C_nH_{2n-2} .

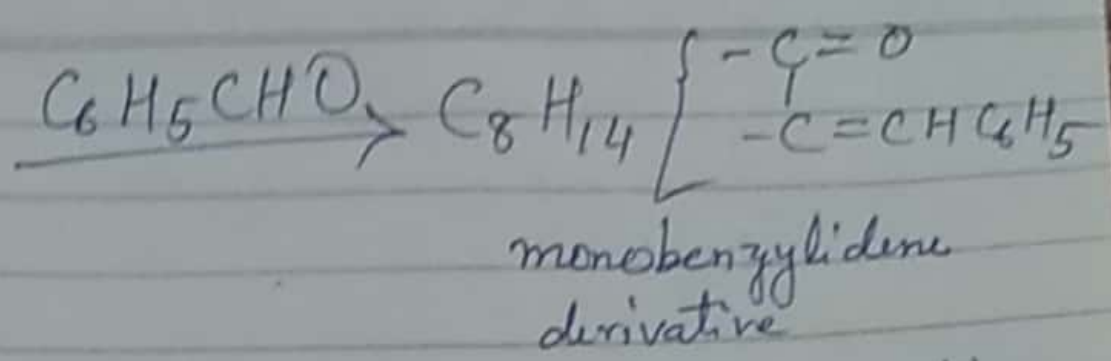
4. ~~Camphor~~ Camphor on condensation with C_6H_5CHO forms monobenzylidene derivative suggesting the presence of $-COCH_2-$ group which is confirmed by the formation of isonitroso derivative (oxime) with nitrous acid (isoamyl nitrite) and HCl .



Isonitroso derivative

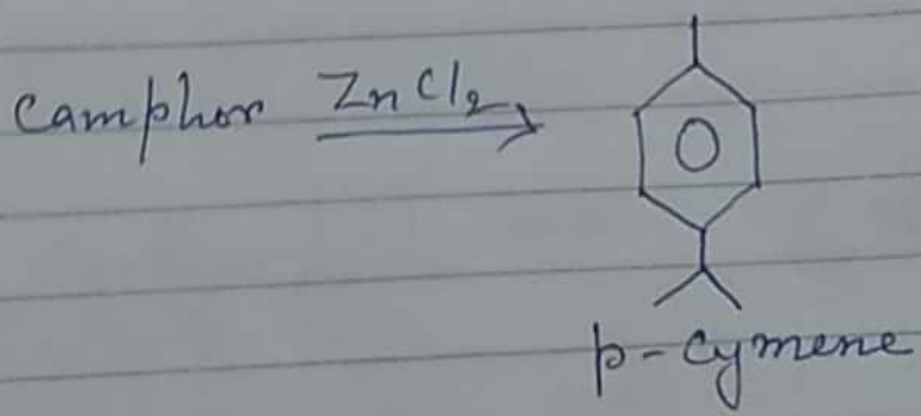


(3)



The presence of $-COCH_2-$ grouping is further confirmed by its oxidation to a dibasic acid, camphoric acid with the same number of C-atoms.

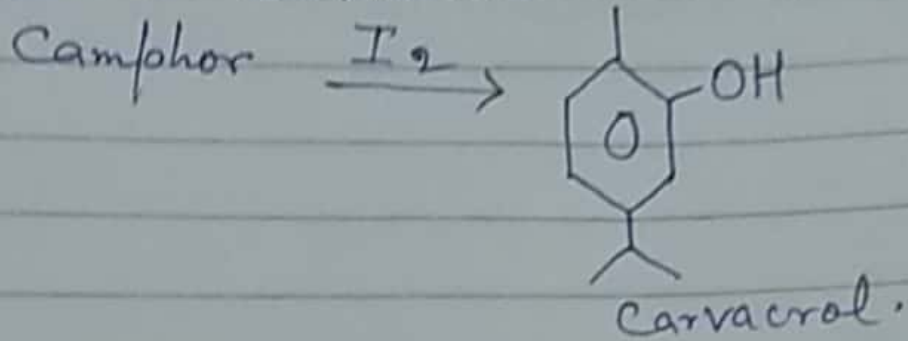
5. Camphor on distillation with $ZnCl_2$ or P_2O_5 gives p-cymene.



Hence, Camphor has a 6-membered ring.

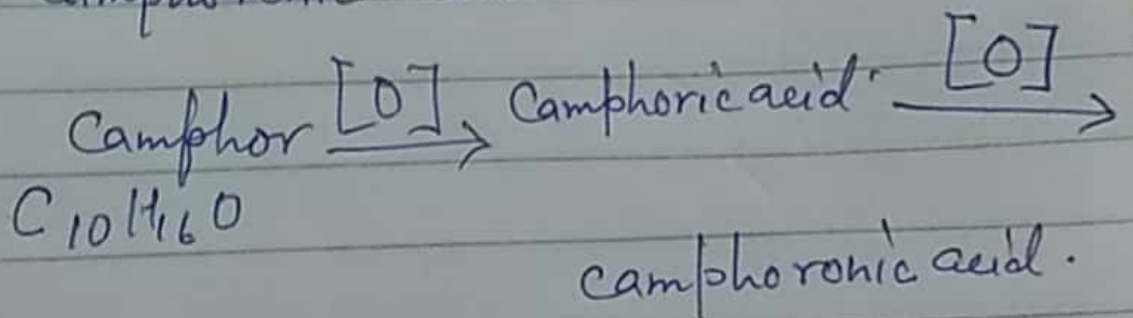
4.

6. Camphor on distillation with I_2 forms Carvacrol



The presence of phenolic group in Carvacrol suggests the presence of $>C=O$ group in Camphor.

7. Oxidation of Camphor with HIO_3 gives Camphoric acid and camphoronic acid —



(To be continues -----)