CAMPHOR

Sem IV
Organic Special Paper
Unit: Terpenoids

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Introduction

•important constituent of oil of camphor

•colourless transparent mass of characterstic smell and burning taste, M.pt. 179^0C and b.pt. 204^0C

•Optically active (+)and (-) forms occur naturally while the recemic form is usually a synthetic product

•Main source is Cinnamomum camphora (camphor tree) which is extremely found In Formosa

•Present in higher proportion in the trunk of the tree

•industrially from α-pinene which in turn obtained from turpentine oil by following series of reactions:

α-pinene

↓

Bonyl chloride

↓

Camphene

↓

isobornyl acetate

↓

isoborneol

↓

camphor

Elucidation of structure of Camphor

Elucidation of structure:

- Molecular formula $C_{10}H_{16}O$

- oxime with NH_2OH, semicarbazone and semicarbazide, and dicarboxylic acid having the same number of carbon atoms on oxidation

- the presence of ketonic group in camphor ($C_{10}H_{18}O$) led $C_{10}H_{18}$ corresponds to C_nH_{2n-2} which confirms a bicyclic compounds

- condensation with C_6H_5CHO forms monobenylidene derivative suggesting the presence of $–CO-CH_2-$ group

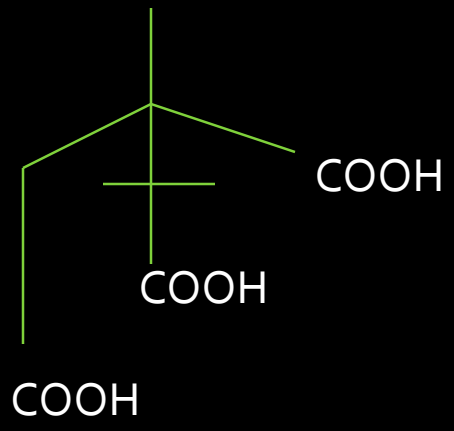
• camphor on distillation with zinc chloride or phosphorous pentaoxide gives p- cymene which suggests one six membered ring

• distillation with iodine gives carvacrol suggest ketonic group in camphor

•Oxidation with nitric acid gives camphoric acid followed by camphoronic acid

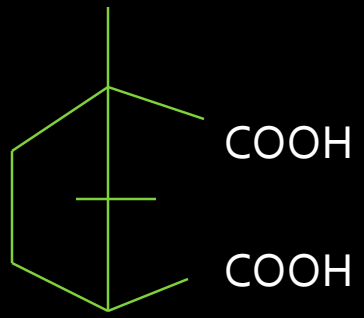
•constitution of camphoronic acid

• structure of camphoronic acid derived

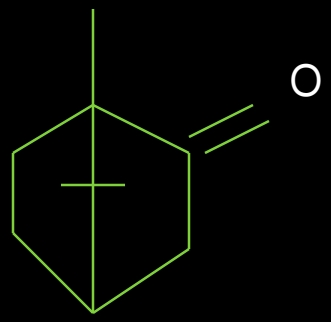


•Constitution of camphoric acid

• Structure of camphoric acid derived



- structure confirmed about the camphor



- Synthesis of camphor

The structure is confirmed by its synthesis

Questions

Q. Elucidate the structure of camphor by destructive as well as synthetic method.

Q. Describe structure elucidation of camphoric acid or camphoronic acid.

Q. Discuss the synthesis of following:
(a) camphoric acid
(b) camphoronic acid
(c) Synthesis of camphor

Thank You