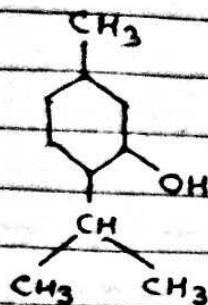


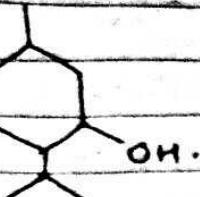
Paper-VII (Unit-5)

Topic - Menthol ($C_{10}H_{20}O$), α -Pinene ($C_{10}H_{16}$) .

Menthol ($C_{10}H_{20}O$) :- It is a monocyclic monoterpenic secondary alcohol having the structure.



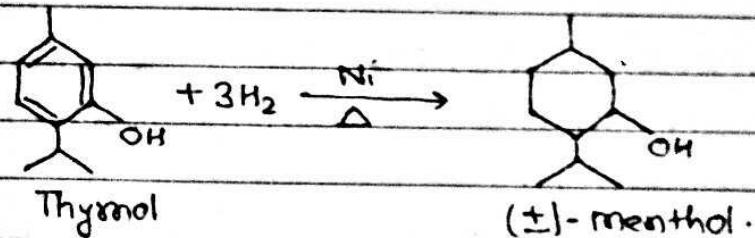
OR



Menthol occurs in peppermint oil and Japanese mint oil.

Preparation :-

- (1) From Peppermint or mint oil :- The oil is chilled when crystals of menthol separate. These are purified by recrystallisation.
- (2) From Thymol :- Menthol is also obtained by catalytic hydrogenation of thymol.

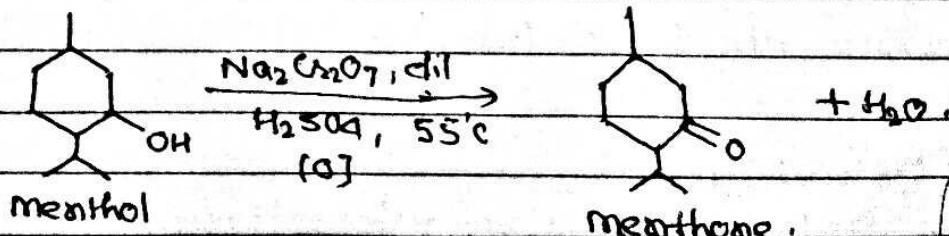


Physical properties :- Menthol is a white crystalline solid with a strong minty odour and cooling taste. It melts at 42°C and boils at 216°C. Natural menthol is optically active - the (-) form. It has anaesthetic and antiseptic action.

Chemical properties :-

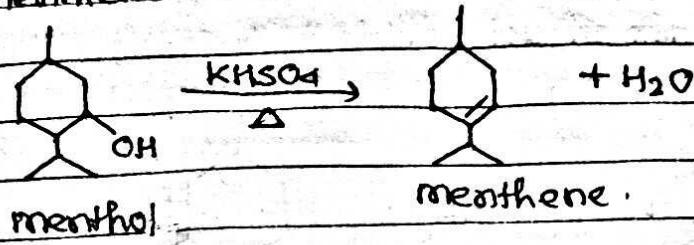
It gives the reactions of an alicyclic secondary alcohol.

- (1) Oxidation :- Upon oxidation with chromic acid, it gives the corresponding ketone, menthone.



- (ii) Dehydration :- When heated with potassium hydrogen sulphate, it

gives menthene.

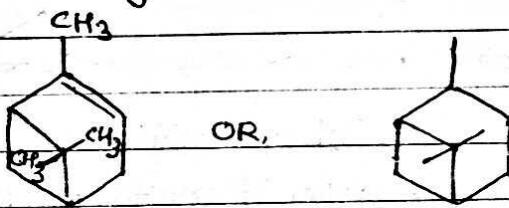


Use of menthol :-

Menthol on account of its anaesthetic and antiseptic action, pleasant odour and cooling taste is used: (1) In pharmaceuticals as local anaesthetic and for relief of headache. (2) In mouth washes, nasal sprays and inhalers (Vick's Inhaler), cough drops, chewing-gums, and methylated cigarettes (3) In cosmetics - toothpastes, shaving creams, shaving lotions, face creams and powders.

α -Pinene ($C_{10}H_{16}$) :-

It is a bicyclic monoterpane and has the structure -



α -Pinene is the chief component of turpentine oil obtained from the pine tree.

Preparation :-

It is isolated from turpentine oil by steam distillation followed by fractional distillation. It is purified by conversion into nitrosyl chloride which on treatment with aniline liberates α -Pinene.

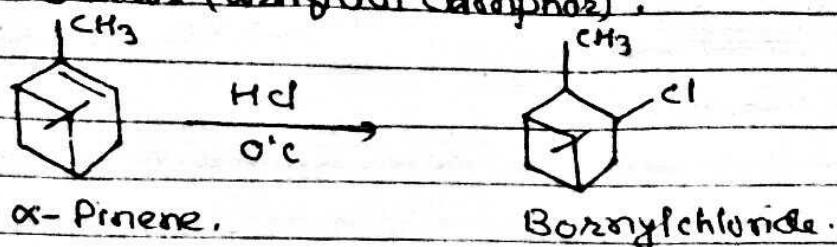
Properties -

i. Physical properties

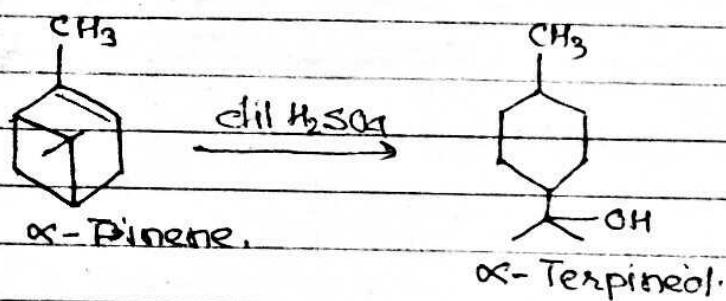
α -Pinene is a colourless liquid bp 156°C. It has a characteristic odour and optically active.

2: Chemical properties :-

(i) Reaction with HCl :- It reacts with dry hydrogen chloride at 0°C to form bornyl chloride, mp 131°C, with a faint camphor odour (artificial camphor).



(ii) Reaction with H₂SO₄ :- When treated with dilute H₂SO₄, the 4-carbon ring in terpene cleaves to form α-Terpineol.



Use of α-Pinene :- Turpentine oil which is mainly α-pinene is used as a thinner for paints and for the commercial synthesis of camphor.

— x — x —