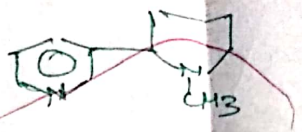
Nicotine: $C_{10}H_{14}N_2$



Found in tobacco leaves as salt of citric & malic acid.

~~Constitution:~~ ① Elemental analysis and mol. wt. show formula $C_{10}H_{14}N_2$.

② Nicotine with CH_3I form two mono methiodide but doesn't give acetyl or benzoyl derivative show +ncl of two 3° N-atom

③ Nicotine on oxidn by $KMnO_4$ gives Nicotinic acid $C_5H_4N\text{-}COOH$

$$C_{10}H_{14}N_2 \xrightarrow{[O]} \text{[pyridine ring]-COOH} \quad [C_5H_4N\text{-}COOH]$$

(Nicotine)

It show that Nicotine contain pyridine ring which has some group attached at 3 position of pyridine ring.

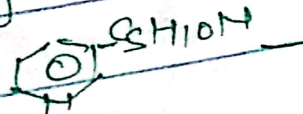
$C_{10}H_{14}N_2 - C_5H_4N = C_5H_{10}N$ (Residual gsp.)

during oxidn this residual gsp. oxidise, so Nicotine is

Nicotine

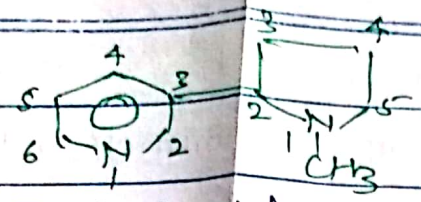
Nicotinic acid

④ Nicotine methiodide on oxidn give hygrinic acid (1-me-pyrrolidine-2-Carboxylic acid). This show +ncl of pyrrolidine ring with me. gsp. at N-atom & some gsp. at position 2

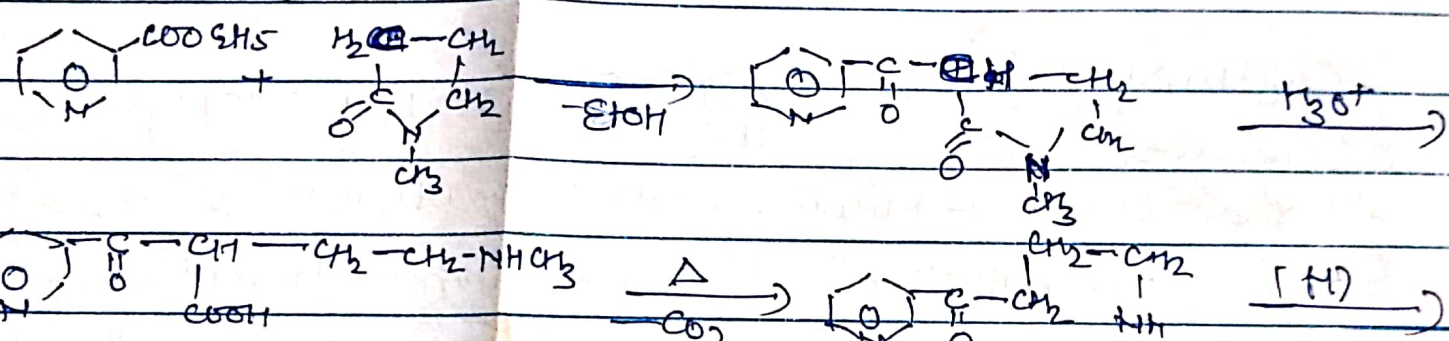


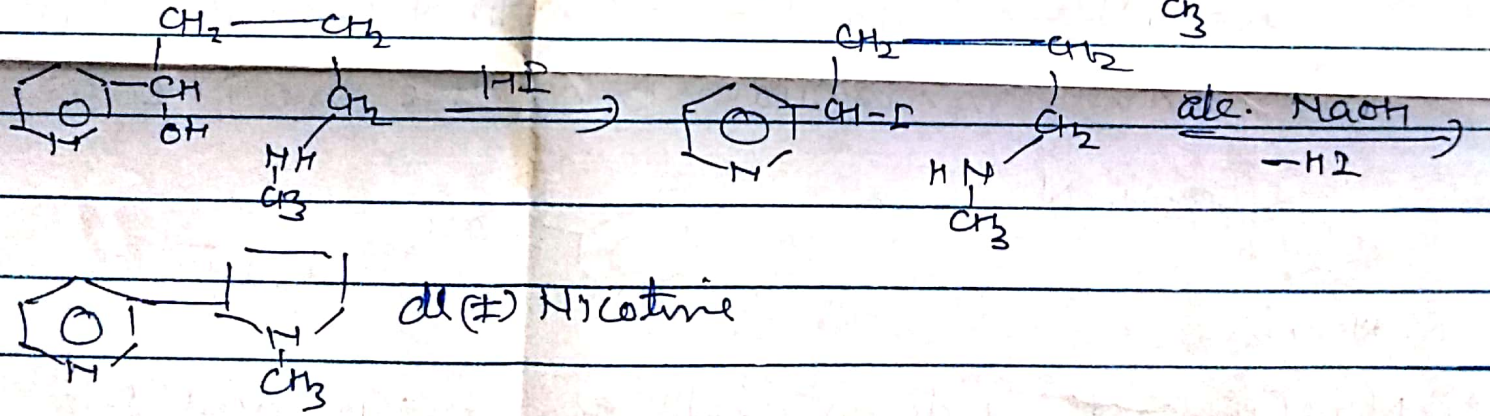
This indicate that during oxidn pyridine ring is oxidise, the gsp. $C_5H_{10}N$ attach to pyrrolidine at position 3 is N-me pyrrolidine

(5) So, in Nicotine pyridine ring & pyrrolidine ring are attached with C-atom at 3 position in pyridine ring & 2 position & pyrrolidine, & structure is



Synth: Späth & Bretschneider: from ethylnicotinate & N-methyl pyrrolidone





dl (±) Nicotine