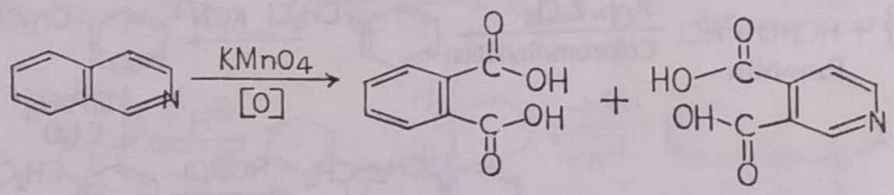
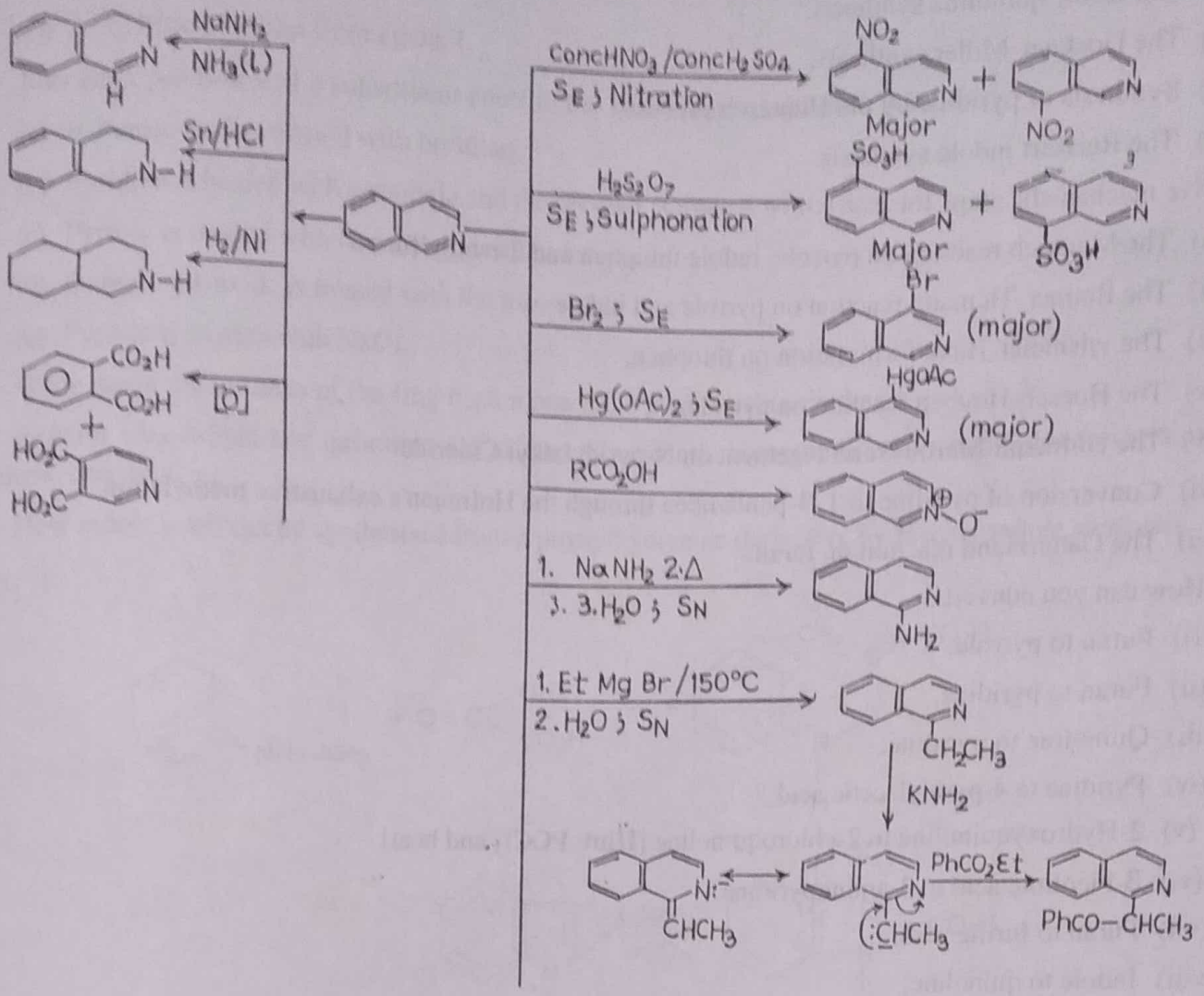
19.8.3 Structure, reactivity and orientation

Isoquinoline on potassium permanganate oxidation produces phthalic acid and Cinchomeronic acid (3, 4-pyridine dicarboxylic acid). The formation of two side chains both in the benzene ring and pyridine ring prove that isoquinoline is a fused ring system involving benzene and pyridine; the products further tells as above the relative positions of the two rings.



Isoquinoline is more reactive than pyridine insofar as Ar S_E2 reactions are concerned. These reactions mainly occur at position 5 and to a small extent at 8. In this regard isoquinoline resembles 2-nitronaphthalene. This is because the more stable pyridine ring is being preserved on electrophilic substitution at 5 and 8 positions. Moreover, a few reactions also occur at 4 position. Nucleophilic substitution reactions occur at position 1. l-alkylated isoquinoline has acidic H's on the α—C of the alkyl group.


NaNH2
NH3(l)
Sn/HCl
H2/Ni
[O]
CO2H
CO2H
HO2C
HO2C
Conc HNO3 / Conc H2SO4
SE ; Nitration
Major
NO2
H2S2O7
SE ; Sulphonation
SO3H
Major
SO3H
Br2 ; SE
(major)
Hg(OAc)2 ; SE
HgOAc
(major)
RCO2OH
1. NaNH2 2. Δ
3. H2O ; SN
NH2
1. Et Mg Br / 150°C
2. H2O ; SN
CH2CH3
KNH2
CHCH3
CHCH3
PhCO2Et
PhCO–CHCH3