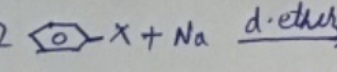
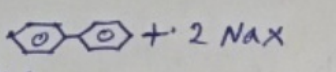
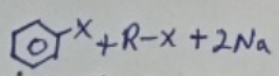
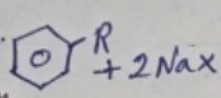
⇒ $2R-X + Na \xrightarrow{[d\cdot ether]} R-R + 2NaX$ ⇒ wurtz Rexn

⇒  + Na $\xrightarrow{d\cdot ether}$  + 2 NaX

⇒  + R-X + 2Na $\xrightarrow{d\cdot ether}$  + 2NaX

Nucleophilic Substitution Reaction

⇒ $R-X + H_2O \longrightarrow R-OH + HX$

⇒ $R-X + KCN \longrightarrow R-CN + KX$

⇒ $R-X + AgCN \longrightarrow R-NC + AgX$

⇒ $R-X + AgNO_2 \longrightarrow R-NO_2 + AgX$

⇒ $R-X + R-O^{-}Na^{+} \xrightarrow{diethyl} R-O-R + NaX$ (williom synthesis) # Prep of ether

(R-X: alkyl halide; R-O⁻Na⁺: sodium alkoxide)

Types of Nucl. Substi. Rex. a) SN^1 b) SN^2

[Nucleophilic substitution unimolecular] [Nucleophilic substitution Bimolecular]

A compound is optically active if it rotates plane polarized light

SN^1 reaction

- First order Reaction occur in Plane Polarized Solvent
- The formation of C^+ in RDS (Rate Determining Step) of SN^1 reaction occur in 2 steps
- Rate ∝ [R-X] ∝ stability of C^+
- SN^1 react is exothermic in nature ⇒ low temp → rate↑
- # Compounds having Chiral compound are optically active
- # Compound having 2 or more chiral compound is optically active if it is not superimposable its mirror image.

★ Mixture of two enantiomers in equal ratio is called racemic Mixture [Denoted by (±)]

SN^2 reaction

- Second order reaction occur in Polar Aprotic Solvent
- Formation of Transition state occurs in 1 step.
- Rate ∝ $[Na^-]$ [R-X], No formation of C^+
- SN^1 reaction is exothermic ⇒ Low Temp → rate↑
- only inversion takes place no Retention.