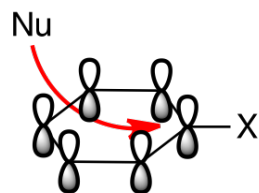


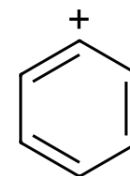
# Nucleophilic Aromatic Substitution

$S_N2$



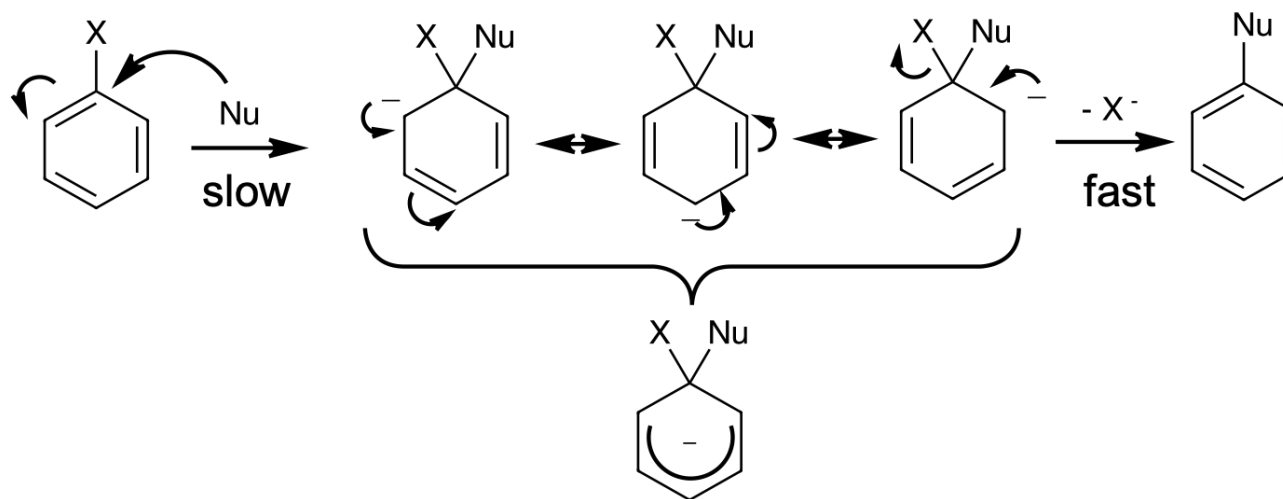
Backside attack is impossible

$S_N1$



Very unstable  $sp^2$  carbocation

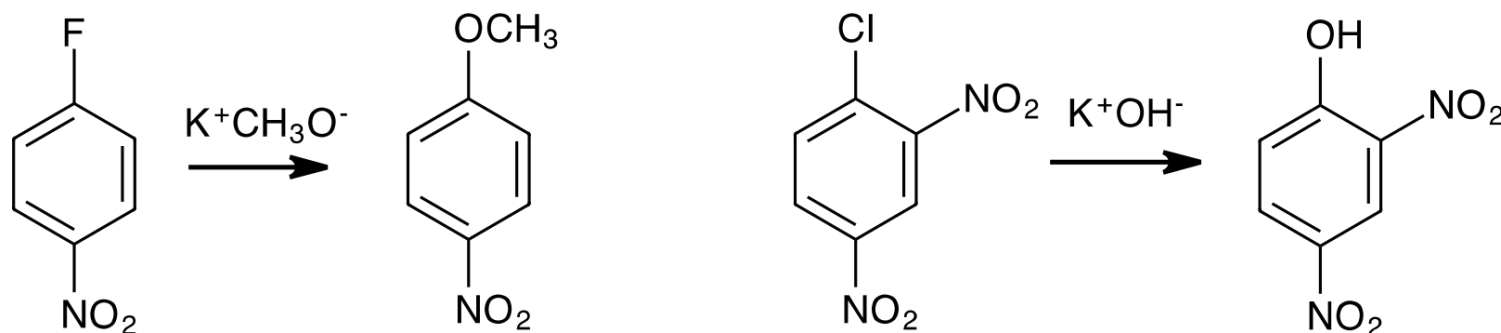
$S_NAr$



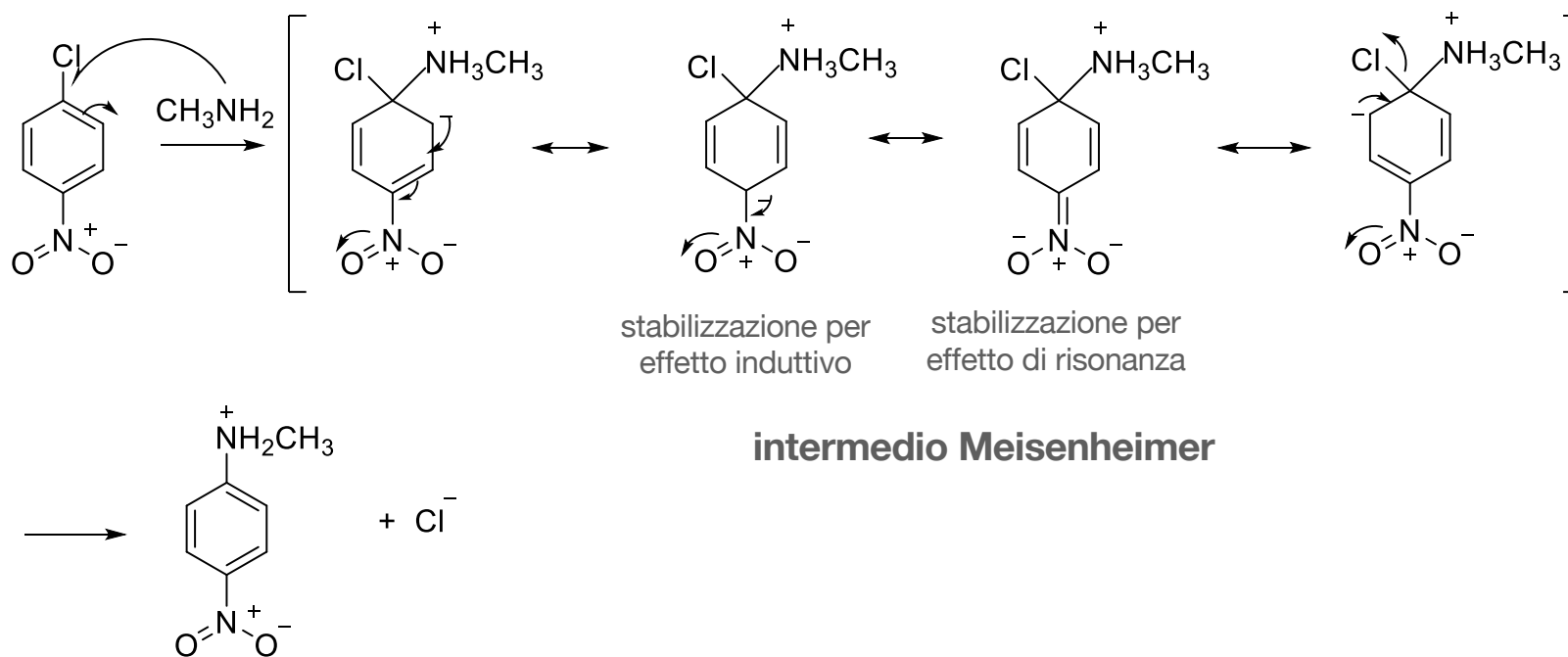
Questa reazione avviene se nell'anello aromatico, in posizione orto o para rispetto all'alogeno, è presente un forte gruppo elettron-attrattore, gruppo attivante.

# Nucleophilic Aromatic Substitutions

- Aromatic compounds are electron rich.
- They react only when strong  $-R$  substituents are present.
- The order of reactivity is  $F > Cl > Br > I$  (per la stabilizzazione dell'intermedio)



# Sostituzione Nucleofila Aromatica



Un gruppo attivante per  $S_NAr$  deve avere effetto  $-I$  e  $-R$ , diversamente dalle  $S_EAr$