Reaction Pathway

Dilute H_2SO_4 / E^+ Addition

+ NH_3

Hydrolysis
(cold, dilute, aq, alkali)
S_N1/S_N2

Optical Isomer

2° Alcohol

1° Alcohol

* S_N1 S_N2

S_N2
Hydrolysis
(cold, dilute, aq, alkali)

1° R – X

2° R – X

3° R – X

3° Alcohol

Hydrolysis
(cold, dilute, aqueous
alkali, OH^-)

**1°, 2°, 3°
Amine**

Halogeno Alkane

E1
Hot, Ethanolic,
Concentrated
Alkali (OH^- as a
Lewis Base)

E2
Hot, Ethanolic,
Concentrated
Alkali (OH^- Lewis
Base)

E^+ Addition
H – X
Markovnikov's Rule
3° C^+ > 2° C^+ > 1° C^+

CN^-
Ascends
homologous
series

**Alkene
C – C (σ and π/ sp²)**

X_2 [E^+ Addition]
* Br_2:Test for unsaturated

**R – CN
(nitrile, aka: cyano)**

Dihalogeno Compound

Reduced, $LiAlH_4$ or
$NaBH_4$

Oxidized, MnO_4/H^+ or
$Cr_2O_7^{-2}/H^+$

**R – CH₂NH₂
1° Amine**

**R – COOH
Carboxylic Acid**