

<p>Amine RNH_2 ↓ Salt e.g. RNH_3Cl</p>	<p>carboxylic acid ↓ potassium salt of the carboxylic acid</p>	<p>carboxylic acid ↓ sodium salt of the carboxylic acid + CO_2 gas</p>	<p>carboxylic acid ↓ sodium salt of the carboxylic acid</p>
<p>HCl acid-base</p>	<p>KOH acid-base</p>	<p>Na_2CO_3 or NaHCO_3 acid-base</p>	<p>NaOH acid-base</p>
<p>alkene ↓ dibromoalkane</p>	<p>alkene ↓ chloroalkane</p>	<p>alkene ↓ alcohol</p>	<p>alkene ↓ dichloroalkane</p>
<p>Br_2 addition</p>	<p>HCl addition</p>	<p>$\text{H}_2\text{O}/\text{H}^+$ addition / hydration</p>	<p>Cl_2 addition</p>
<p>alkene ↓ alkane</p>	<p>monomer $n\text{C}_2\text{H}_4$ ↓ polymer $-(\text{C}_2\text{H}_4)_n$</p>	<p>alcohol R-OH ↓ alkene</p>	<p>haloalkane R-Cl ↓ alkene</p>
<p>H_2, Ni cat., heat addition (hydrogenation)</p>	<p>Heat, catalyst addition (polymerisation)</p>	<p>conc. H_2SO_4, heat elimination / dehydration</p>	<p>KOH (alc) elimination</p>
<p>C1 = Meth- C2 = Eth- C3 = Prop- C4 = But-</p>	<p>primary alcohol ↓ carboxylic acid</p>	<p>primary alcohol ↓ carboxylic acid</p>	<p>alkene ↓ diol</p>
<p><u>many</u> <u>e</u>lephants prefer <u>b</u>ananas 😊</p>	<p>$\text{H}^+/\text{MnO}_4^-$, heat oxidation</p>	<p>$\text{H}^+/\text{Cr}_2\text{O}_7^{2-}$, heat oxidation</p>	<p>$\text{H}^+/\text{MnO}_4^-$ oxidation</p>

haloalkane R-Cl ↓ alcohol R-OH	alkane ↓ chloroalkane	haloalkane ↓ amine	alcohol ↓ haloalkane
KOH (aq) <i>substitution</i>	Cl ₂ , uv light &/or heat <i>substitution</i>	conc. NH ₃ (alc) <i>substitution</i>	PCl ₃ or PCl ₅ or SOCl ₂ <i>substitution</i>
addition of unsymmetrical reagent e.g. HCl to asymmetric alkene e.g. to but-1-ene	Removal of H ₂ O from an asymmetric alcohol e.g. butan- 2-ol	Removal of HX from an asymmetric haloalkane e.g. 2- chlorobutane	Distinguish between a 1° alcohol & carboxylic acid Heat with H ⁺ /MnO ₄ ⁻
2 products (major/minor) "rich get richer"	2 alkene products (major/minor) "poor get poorer"	2 alkene products (major/minor) "poor get poorer"	purple MnO ₄ ⁻ converted to colourless Mn ²⁺ by alcohol, with carboxylic acid no change
Distinguish between carboxylic acid & amine Use UI / litmus	Distinguish between alkene & a primary alcohol Add Br ₂	Distinguish between alkene & a primary alcohol Heat with H ⁺ /Cr ₂ O ₇ ²⁻	Distinguish between a 1° alcohol & carboxylic acid Heat with H ⁺ /Cr ₂ O ₇ ²⁻
carboxylic acid turns UI orange or litmus red, with amine turns blue	Br ₂ decolourised (orange to colourless) by alkene, not by alcohol	alcohol reduces orange Cr ₂ O ₇ ²⁻ to green Cr ³⁺ , with alkene no change	orange Cr ₂ O ₇ ²⁻ converted to green Cr ³⁺ by alcohol, with carboxylic acid no change
Distinguish between alkane & alkene Use Br ₂	Distinguish between alkane & alkene Use H ⁺ /MnO ₄ ⁻ (no heat needed)	C5 = Pent- C6 = Hex- C7 = Hept- C8 = Oct-	C1 = Meth- C2 = Eth- C3 = Prop- C4 = But-
Br ₂ decolourised rapidly (orange to colourless) by alkene, alkane much slower, needs uv light	purple MnO ₄ ⁻ converted to colourless Mn ²⁺ by alkene, no change with the alkane	Just know your maths shapes☺	<u>must eat peanut</u> <u>butter</u> ☺