

Alkane ↓ Haloalkane R-X	Alkene (C=C) ↓ Haloalkane R-X e.g. CH <sub>3</sub> CHBrCH <sub>3</sub>	Alkene (C=C) ↓ Haloalkane e.g. CH <sub>2</sub> BrCHBrCH <sub>3</sub>	Alkene (C=C) ↓ Alcohol R-OH
Br <sub>2</sub> or Cl <sub>2</sub> & uv light (substitution)	Shake with HBr (addition)	Shake with Br <sub>2</sub> (addition)	H <sup>+</sup> /H <sub>2</sub> O (hydration/addition)
Haloalkane R-X ↓ Alcohol R-OH	Haloalkane R-X ↓ Alkene	Alcohol R-OH ↓ Haloalkane R-Cl	Carboxylic acid R-COOH ↓ Acid (acyl) chloride R-COCl
Heat under reflux with KOH or NaOH (aq) (substitution)	Heat under reflux with KOH or NaOH (alc) (elimination)	Add SOCl <sub>2</sub> (or PCl <sub>5</sub> or PCl <sub>3</sub> ) (substitution)	Add SOCl <sub>2</sub> (or PCl <sub>5</sub> or PCl <sub>3</sub> ) (substitution)
Alcohol R-OH ↓ Ester R-COO-R'	Carboxylic acid R-COOH ↓ Ester R-COO-R'	Primary Alcohol R-OH ↓ Aldehyde R-CHO (heat & distil off as formed)	Primary Alcohol R-OH ↓ Carboxylic acid R-COOH (heat under reflux)
Heat with c. acid & conc. H <sub>2</sub> SO <sub>4</sub> (condensation)	Heat with alcohol & conc. H <sub>2</sub> SO <sub>4</sub> (condensation)	Heat with H <sup>+</sup> /Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup> (oxidation)	Heat with H <sup>+</sup> /Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup> or H <sup>+</sup> /MnO <sub>4</sub> <sup>-</sup> (oxidation)
Secondary Alcohol RCH(OH)R ↓ Ketone RCOR (heat under reflux)	Ester R'-COO-R ↓ Alcohol R-OH & carboxylic acid R'-COOH	Ester R'-COO-R ↓ Alcohol R-OH & sodium salt of a carboxylic acid R'COO <sup>-</sup> Na <sup>+</sup>	Ester R'-COO-R ↓ Alcohol R-OH & Amide R'-CONH <sub>2</sub>
Heat with H <sup>+</sup> /Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup> or H <sup>+</sup> /MnO <sub>4</sub> <sup>-</sup> (oxidation)	Heat with H <sup>+</sup> /H <sub>2</sub> O (acid hydrolysis)	Heat with NaOH(aq) (alkaline hydrolysis)	Heat with NH <sub>3</sub> (alc)

Carboxylic acid $R-COOH$ ↓ $RCONH-R'$	Alkene ( $C=C$ ) ↓ Alkane	Acid chloride $R-COCl$ ↓ Amide $R-CONH_2$	Acid chloride $R-COCl$ ↓ Carboxylic acid $R-COOH$
Heat with $R'-NH_2$ (condensation)	Heat with $H_2$ , Ni or Pt catalyst (addition)	Add conc. $NH_3(alc)$ (substitution)	Just add water (hydrolysis)
Haloalkane $R-X$ ↓ Amine $R-NH_2$ <i>(simplified)</i>	Haloalkane $R-X$ ↓ $R-NH_3^+ X^-$ ↓ Amide $R-NH_2$	Acid chloride $R-COCl$ ↓ secondary amide $R-CONH-R'$	Acid chloride $R-COCl$ ↓ Ester $R-COOR'$
Heat with conc. $NH_3$ (alc) (substitution)	Heat with excess $NH_3(alc)$ (substitution)	Add amine $R'NH_2$ (condensation)	Add $R'-OH$ (condensation)
Alcohol $R-OH$ ↓ Alkene ( $C=C$ )	Amine $R-NH_2$ ↓ Salt $R-NH_3^+ Cl^-$	Carboxylic acid $R-COOH$ ↓ Amide $R-CONH_2$	Amide $R-CONH_2$ ↓ Carboxylic acid $R-COOH$
Conc. $H_2SO_4$ (dehydration / elimination)	$HCl(g)$ (acid-base)	Treat with $(NH_4)_2CO_3$ & then heat	Heat with $H^+/H_2O$ (hydrolysis)
Carboxylic acid $R-COOH$ ↓ Sodium salt of a carboxylic acid $R-COO^- Na^+$	Carboxylic acid $R-COOH$ ↓ $R'NH_3^+ + CH_3COO^-$		
Add $NaOH$ , $NaHCO_3$ or $Na_2CO_3$ (acid-base)	Mix with $R'-NH_2$ (acid-base)		

reaction in which two groups or atoms on neighbouring carbon atoms are removed from a molecule, thereby leaving a multiple bond between two carbon atoms	reaction in which atoms or groups join to two atoms joined by a multiple bond. The product is a single molecule that contains all of the reactants	reaction in which two molecules combine to form a larger one, and a small molecule is eliminated	reaction of water with a substance
elimination	addition	condensation	hydrolysis

Spare cards have been included so you can make your own if I have missed any you need.