

<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Oxidation of a primary alcohol to an aldehyde</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Oxidation of a tertiary alcohol</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Making an ester from an alcohol and a carboxylic acid</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Conversion of a haloalkane to an alcohol</p>
<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Oxidation of a primary alcohol to carboxylic acid</p>	<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Identification of alcohols with Lucas reagent – anhydrous <math>ZnCl_2</math> / conc. HCl</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Making an ester from an alcohol and an acid chloride</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Conversion of a haloalkane to an alkene</p>
<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Oxidation of a secondary alcohol to ketone</p>	<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Identification of a carboxylic acid</p>	<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Identification of an amine</p>	<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Reaction of ketone with Tollen's or with Fehling's / Benedict's solution</p>
<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Identification of an aldehyde – Tollens reagent</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Turn a carboxylic acid into an acid chloride</p>	<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Identification of an acid chloride</p>	<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Distinguishing between an alkane and alkene</p>
<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Identification of an aldehyde – Fehling's or Benedict's solution</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Turn an alcohol to a haloalkane</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Dehydration of an alcohol to an alkene</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Turn an alkene into an alcohol</p>

<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Making an N-substituted amide R-COONH-R</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Conversion of haloalkane to amine</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Acid hydrolysis of an ester</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Alkaline hydrolysis of an ester</p>
<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Hydrolysis of a dipeptide (a) heat with dilute acid (b) heat with dilute alkali</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Reaction of R-COOH and R'-NH<sub>2</sub> (a) Room temp (acid-base) (b) Heat - condensation reaction</p>	<p><input checked="" type="checkbox"/> <u>CONVERSION</u></p> <p>Turn an alkene to haloalkane (with just one halogen atom)</p>	<p><input checked="" type="checkbox"/> <u>IDENTIFICATION</u></p> <p>Identify an ester</p>
<p><input checked="" type="checkbox"/> <u>APPARATUS/PROCEDURE</u></p> <p>separating funnel</p>	<p><input checked="" type="checkbox"/> <u>APPARATUS/PROCEDURE</u></p> <p>add anhydrous ____ e.g. <u>anhydrous</u> magnesium or sodium sulfate or calcium chloride</p>	<p><input checked="" type="checkbox"/> <u>APPARATUS/PROCEDURE</u></p> <p>heat under reflux</p>	<p><input checked="" type="checkbox"/> <u>APPARATUS/PROCEDURE</u></p> <p>distil</p>
<p><input checked="" type="checkbox"/> <u>NAME THAT REACTION TYPE!</u></p> <p>electrons are lost /oxidation no. of carbon increases / Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> is reduced to Cr<sup>3+</sup> so the alcohol is .....</p>	<p><input checked="" type="checkbox"/> <u>NAME THAT REACTION TYPE!</u></p> <p>Br<sup>-</sup> /Br; is removed and exchanged/swapped with/changed for; an OH<sup>-</sup>/OH group</p>	<p><input checked="" type="checkbox"/> <u>NAME THAT REACTION TYPE!</u></p> <p>The molecule HCl / a Cl atom and an H atom removed and a double bond is created</p>	<p><input checked="" type="checkbox"/> <u>APPARATUS/PROCEDURE</u></p> <p>Add concentrated Na<sub>2</sub>CO<sub>3</sub> / NaHCO<sub>3</sub> solution</p>
<p><input checked="" type="checkbox"/> <u>NAME THAT REACTION TYPE!</u></p> <p><i>Joining of molecules with the removal of a small molecule, eg water</i></p>	<p><input checked="" type="checkbox"/> <u>NAME THAT REACTION TYPE!</u></p> <p><i>A small molecule, such as H<sub>2</sub>O or HCl, is eliminated when the monomers join</i></p>	<p><input checked="" type="checkbox"/> <u>NAME THAT REACTION TYPE!</u></p> <p><i>Breaking the double bond between carbons, forming a single bond in its place, and two new single bonds</i></p>	<p><input checked="" type="checkbox"/> <b>Print pages 1&amp;3 and 2&amp;4 back to back.</b> <b>😊 are the answers.</b></p>



Heat with KOH(aq) – or NaOH(aq)



Heat with KOH(alc) – or NaOH(alc)  
Alcohol used is ethanol so may be written KOH(ethanol)



No reaction!  
Say “no reaction so no colour change observed!”



Add Br<sub>2</sub> water; alkane decolourises the bromine slowly with UV. light and/or heat; alkene immediately decolourises bromine water (orange to colourless)



H<sup>+</sup>/H<sub>2</sub>O (React with Conc. H<sub>2</sub>SO<sub>4</sub> & then with water)  
(Remember to check for “rich get richer” if unsymmetrical alkene)



Heat them together under reflux with conc. H<sub>2</sub>SO<sub>4</sub>



Mix them together! Acid chlorides are very reactive! Don't need heat and/or catalyst



Red litmus – turns blue  
Smell – often fishy  
Add Cu<sup>2+</sup>(aq) – deep blue colour solution due to complex ion [Cu(RNH<sub>2</sub>)<sub>4</sub>]<sup>2+</sup>



Fumes in damp air OR add water – fumes vigorously. Hold moist blue litmus above – turns red (due to HCl(g)) OR bring near conc NH<sub>3</sub> bottle – white fumes



Heat with concentrated H<sub>2</sub>SO<sub>4</sub>  
(Remember to check for “poor get poorer”)



Forget it; Heat with H<sup>+</sup>/Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> and there is no colour change (stays orange) as 3<sup>o</sup> alcohol isn't oxidised



1<sup>o</sup> – very, very slow / no cloudiness, 2<sup>o</sup> – cloudy after 10 minutes or so, 3<sup>o</sup> – cloudy almost immediately. Cloudiness due to formation of insoluble haloalkane



+ UI / litmus; UI orange, litmus red  
+ reactive metal – H<sub>2</sub> gas  
+ carbonate / hydrogen carbonate – CO<sub>2</sub> gas



SOCl<sub>2</sub>, thionyl chloride



SOCl<sub>2</sub>, thionyl chloride for 1<sup>o</sup>, 2<sup>o</sup> or 3<sup>o</sup>. Other possibilities are PCl<sub>5</sub>, PCl<sub>3</sub> or conc HCl + ZnCl<sub>2</sub> or conc. HCl. 3<sup>o</sup> easier than 2<sup>o</sup> which are easier than 1<sup>o</sup> to substitute



Heat with H<sup>+</sup>/Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> and distil it off as it forms; Orange to green colour change as Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> is reduced to Cr<sup>3+</sup>



Heat with H<sup>+</sup>/Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> (or use H<sup>+</sup>/MnO<sub>4</sub><sup>-</sup>) under reflux; Orange to green as Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> is reduced to Cr<sup>3+</sup>



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> under reflux; Orange to green as Cr<sub>2</sub>O<sub>7</sub><sup>2-</sup> is reduced to Cr<sup>3+</sup>



Heat with [Ag(NH<sub>3</sub>)<sub>2</sub>]<sup>+</sup> (aq); positive result is a silver mirror as colourless Ag<sup>+</sup>(aq) is reduced to metallic silver



Heat with Fehling's or Benedict's which contain Cu<sup>2+</sup>(aq); positive result - “brick red” (red-orange) precipitate of Cu<sub>2</sub>O as Cu<sup>2+</sup> is reduced to Cu<sup>+</sup>



Heat with dilute NaOH

Products: R-OH and R-COO<sup>-</sup> Na<sup>+</sup>



Heat with dilute acid

Products: R-OH and R-COOH



Conc. ammonia solution (in ethanol)



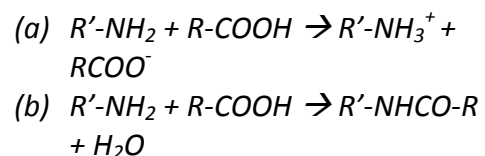
React amine with an acid chloride (HCl is lost)



No real test but insoluble in water (and so "neutral" to litmus / UI) & often have a pleasant fruity smell



Add HX e.g. HCl or HBr



Get 2 amino acids: With dilute acid -NH<sub>2</sub> end is -NH<sub>3</sub><sup>+</sup> and -COOH end is -COOH  
With dilute alkali, the -NH<sub>2</sub> end is -NH<sub>2</sub>, and -COOH end is -COO<sup>-</sup>



Purifies sample – separates it from impurities with different b. pt.  
NOTE: also used to prepare an aldehyde from 1° alcohol (prevents further oxidation to carboxylic acid)



Rate of reaction increased by heating organic reaction without losing volatile organic reactants or products through evaporation



Act as a drying agent: To dry an organic product such as an ester by absorbing water



Allows two reactants to be shaken together and for compounds to be separated based on their **solubility** or **polarity**



To neutralise any acid (often used in ester preparation)



Elimination reaction (e.g. dehydration of alcohol or conversion of haloalkane to alkene)



Substitution reaction (e.g. conversion of haloalkane to alcohol or alkane to haloalkane)



Oxidation reaction

**Well done!!**



Addition reaction  
Watch out for unsymmetrical reagent / alkene (rich get richer)



Condensation polymerisation



Condensation reaction