

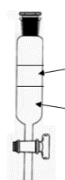


C 1-4/5 (small) alcohols amines aldehydes & ketones carboxylic acids amides & very small esters	C ≥ 5 (larger) alcohols, amines carboxylic acids, amides, esters AND <u>all</u> alkanes, alkenes, alkynes and haloalkanes	Turn moist red litmus paper blue	Turn moist blue litmus paper red
soluble in water / have 1 layer	insoluble in water / make 2 layers	amine	carboxylic acid
Turn UI solution green to blue / turn moist UI paper blue	Turn UI solution from green to orange / turn moist UI paper orange	Turn Cr₂O₇²⁻ /H ⁺ (aq) to Cr³⁺ (aq), colour change orange to green when heated.	Turn MnO₄⁻ /H ⁺ (aq) to Mn ²⁺ (aq), colour change purple to colourless when heated.
amine	carboxylic acid	primary alcohol secondary alcohol aldehyde	primary alcohol secondary alcohol aldehyde
Turn MnO₄⁻ /H ⁺ to Mn ²⁺ , colour change purple solution to colourless solution – NO HEAT needed	Turn MnO₄⁻ to MnO₂ colour change purple solution to brown precipitate – NO HEAT needed	React with NaHCO ₃ or Na ₂ CO ₃ solid or solution (or any salt containing carbonate ion) producing colourless gas	React with Mg (or any reactive metal) producing colourless gas
alkene (makes the diol)	alkene (makes the diol)	carboxylic acid (gas made is CO ₂)	carboxylic acid (gas made is H ₂)
Have a rotten, decomposing or a fishy smell 	Have a 'sharp' or vinegary or baby vomit smell	Rapidly decolourise orange bromine water, Br₂	Slowly decolourise orange bromine water, Br₂ , needing <i>uv</i> light and/or heat
amines	carboxylic acids	alkenes and alkynes (unsaturated)	alkanes / other molecules with C-C bonds (saturated)

Often have a pleasant fruity smell (or deep heat smell)	React vigorously / violently with water making fumes of HCl; remaining solution is acidic	React with blue $\text{Cu}^{2+}(\text{aq})$ to form a deep blue solution of $[\text{Cu}(\text{RNH}_2)_4]^{2+}(\text{aq})$	Give a silver mirror (or black ppt) with Tollens' reagent $[\text{Ag}(\text{NH}_3)_2]^+$ or Ag^+/NH_3
esters	acid / acyl chloride	amine	aldehyde
Give a red/orange precipitate of Cu_2O with Benedict's or Fehling's reagent /solution Cu^{2+}	Able to rotate plane polarised light	Soluble in water - one layer	Insoluble in water - two layers
aldehyde	molecule with chiral / asymmetric C atom	polar molecule	non-polar molecule or one with large non-polar region
<u>Organic synthesis</u> Increase rate as can heat without loss of products/ reactants as they condense back into the mixture 	<u>Organic synthesis</u> Separation based on boiling point / purification technique 	<u>Organic synthesis</u> Role of conc. H_2SO_4 when making an ester from RCOOH and $\text{R}'\text{OH}$	<u>Organic synthesis</u> Add ___ carbonate or ___ hydrogen carbonate; release pressure
(heat under) reflux	distillation	catalyst & dehydrating agent (favouring ester)	to remove (unreacted) acid(s)
<u>Organic synthesis</u> Add anhydrous _____ (solid), decant off liquid	<u>Organic synthesis</u> Separating funnel  organic layer aqueous layer	Melting point and boiling point	Release NH_3 gas if heated with NaOH ; $\text{NH}_3(\text{g})$ turns red litmus blue
removes water / act as a drying agent	separate non-polar/polar liquids, organic/aqueous	indication of strength of intermolecular attractions	amide