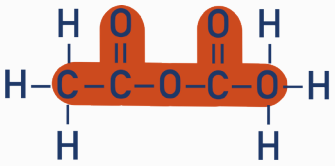
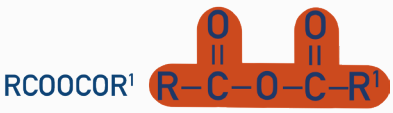
Organic Chemistry Revision Sheets
Functional Groups and Tests

Acid Anhydride

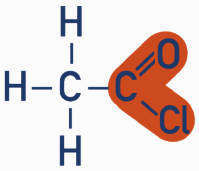


methanoic anhydride



Acyl Chloride

TEST: SLOWLY add water
RESULT: Misty white fumes (HCl) given off

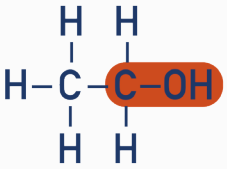


ethan-oyl chloride

General Formula
$C_nH_{2n-1}OCl$

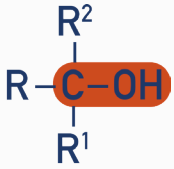
Alcohol

TEST: Warm with acidified potassium di choromate (VI) ($Cr_2O_7^{2-}$ / H^+)
RESULT: Solution turns from orange to green (**for primary and secondary alcohols only**)



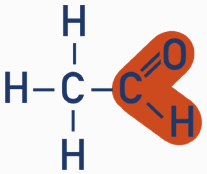
ethan-ol

General Formula
$C_nH_{2n+1}OH$



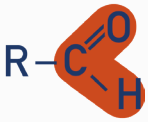
Aldehyde

TEST: Warm with Fehling's Solution ***or*** Warm with Tollens' Reagent
RESULT: Fehling's - red precipitate forms from blue solution
Tollens' - silver mirror forms



ethan-al

General Formula
$C_nH_{2n}O$



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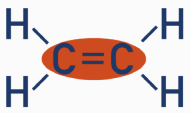
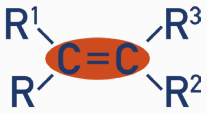
Alkene

TEST: Addition of bromine water
RESULT: Solution turns from orange-brown to colourless

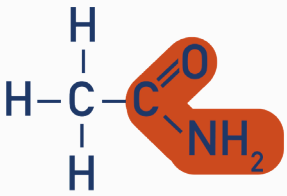


eth-ene

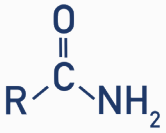
General Formula
C_nH_{2n}



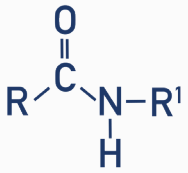
Amide



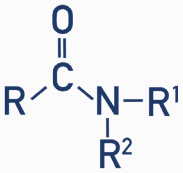
ethan-amide



Primary Amide

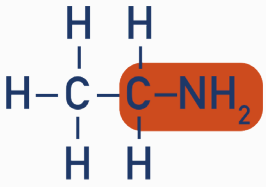


Secondary Amide



Tertiary Amide

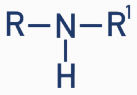
Amine



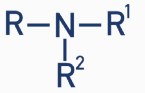
ethyl-amine

Primary Amine

Secondary Amine

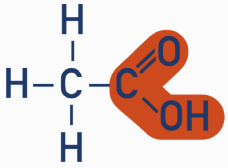


Tertiary Amine



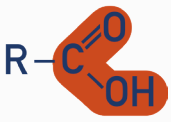
Carboxylic Acid

TEST: Add sodium carbonate (Na_2CO_3), test gas formed with limewater
RESULT: Effervesence and gas turns lime-water from colourless to cloudy



ethan-oic acid

General Formula
$C_nH_{2n+1}COOH$



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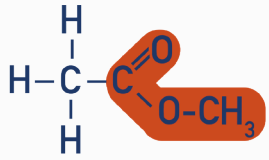
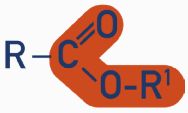
Ester

IDENTIFICATION: Sweet, fruity smell



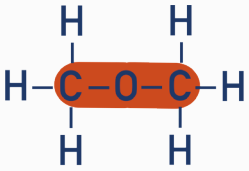
methyl-ethanoate

General Formula
$RCOOR^1$



Ether

'Dry Ether' refers to the use of di-ethyl-ether as a solvent with no water present



dimethyl-ether

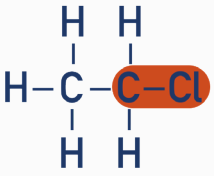
ROR^1

Halogenoalkane (haloalkane)

TEST: Addition of hydroxide ions (in ethanol), followed by (dilute) nitric acid and silver nitrate ($AgNO_3$)

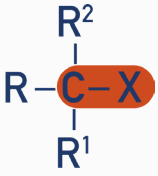
RESULT: Precipitate forms, colour is based on halogen

Cl = white ppt, Br = cream ppt and I = yellow ppt



chloro-ethane

General Formula
$C_nH_{2n+1}X$



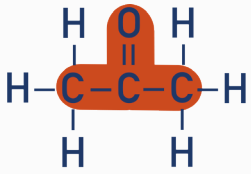
X = Halogen
(F, Cl, Br or I)

Ketone

TEST: Brady's Reagent, 2,4-dinitrophe-nylhydrazine in dilute acid.

RESULT: Orange-Yellow crystals form.

Note - this is a positive test for the C=O bond (get same result with aldehyde)



propan-one

General Formula
$C_nH_{2n}O$