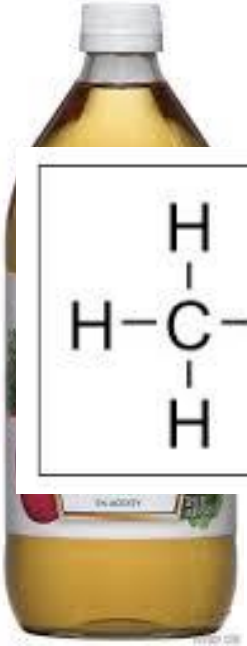
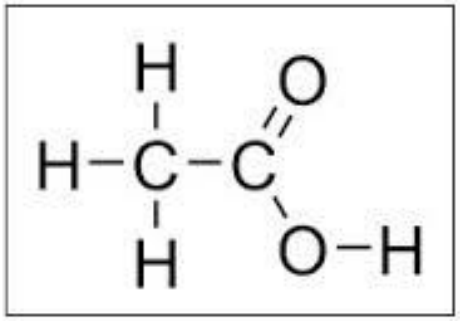
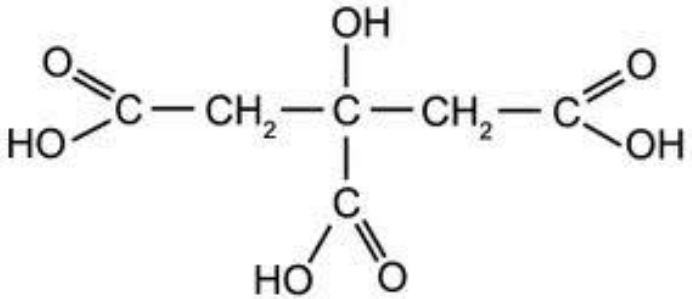
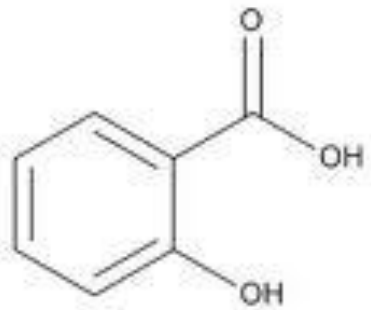




Carboxylic Acids





C7 H6 O3

Naming and drawing carboxylic acids

The suffix for naming carboxylic acids is –anoic acid.
The carboxylic acid functional group must be on carbon 1 and the other side chains are named accordingly. The 1 does not feature in the name of the carboxylic acid.

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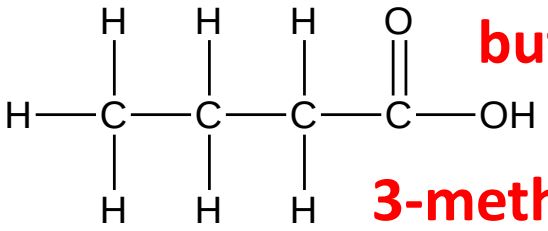
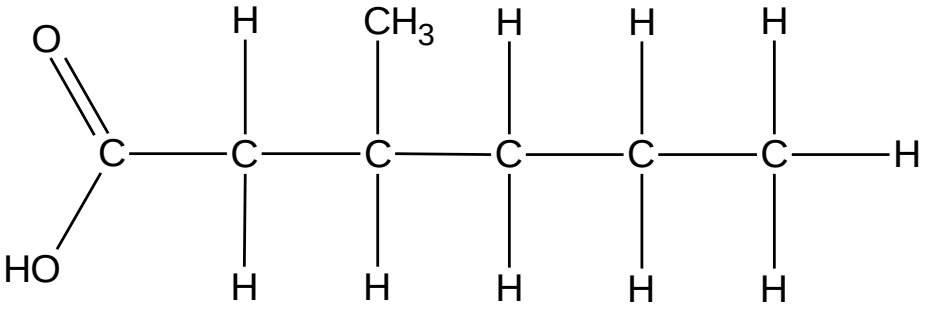
Name these:



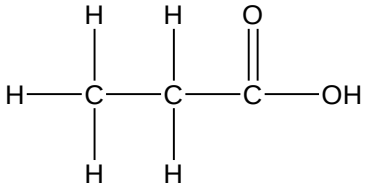
butanoic acid



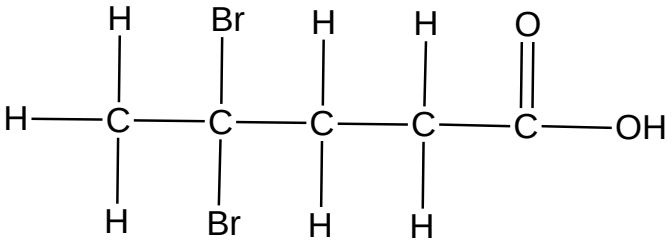
3-methylhexanoic acid

Draw these:

propanoic acid

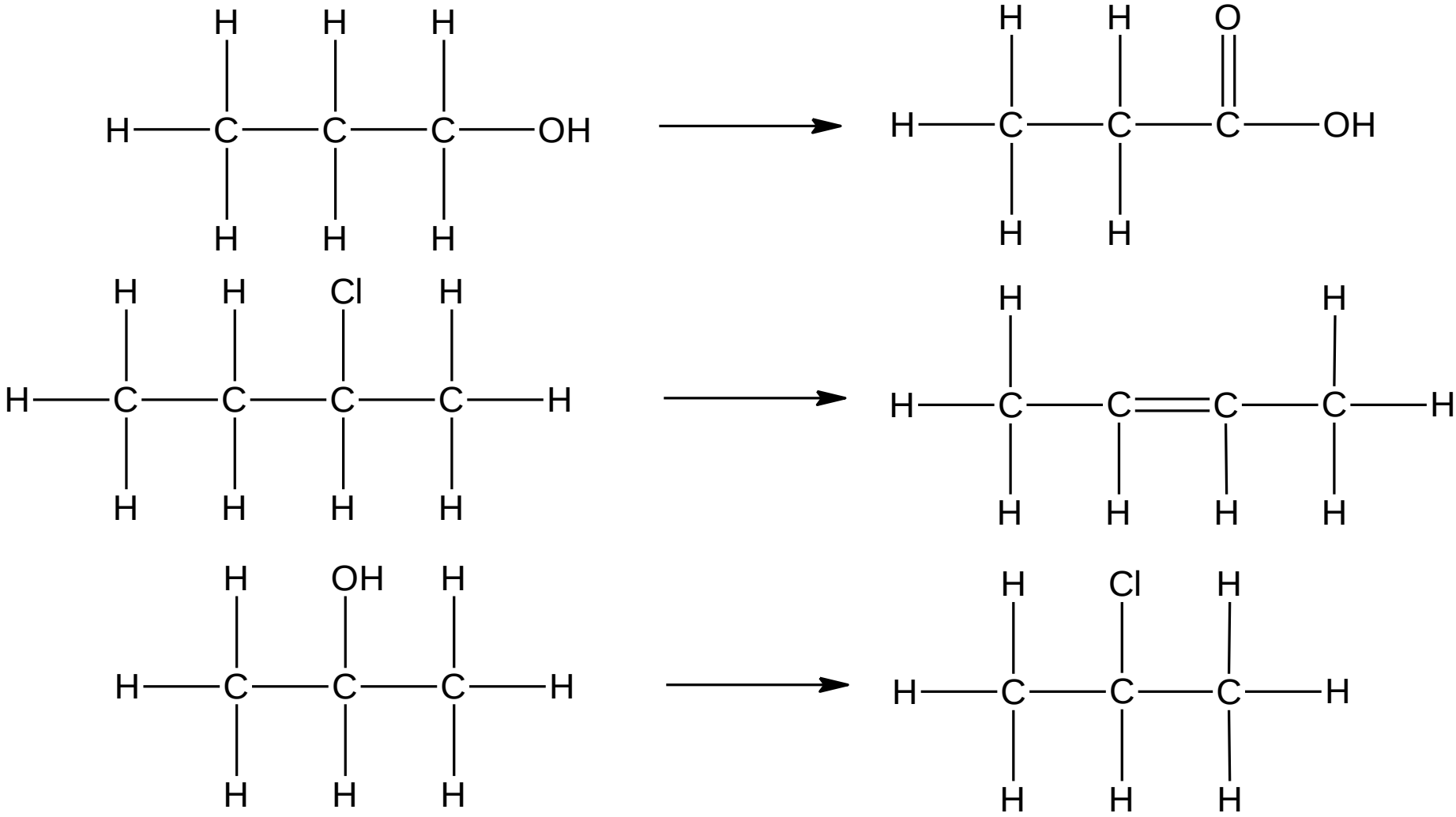


4,4-dibromopentanoic acid



Do now:

Write down the **reagent** required to carry out these reactions



Properties of carboxylic acids

Carboxylic acids have **higher** melting and boiling points than hydrocarbons because they are **polar** and have **strong** intermolecular forces.

Carboxylic acids with small carbon chains are soluble in water, carboxylic acids with long carbon chains (greater than 5) are solid and insoluble in water.

Reactions of carboxylic acids

Carboxylic acids are formed by the oxidation of primary alcohols with either MnO_4^-/H^+ or $Cr_2O_7^{2-}/H^+$.

purple to colourless

orange to green

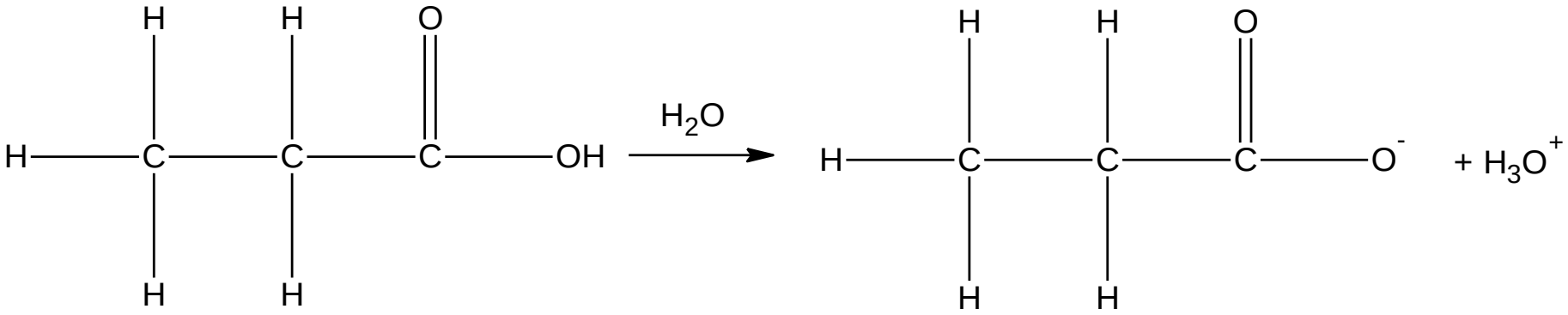
Acidity of carboxylic acids

Carboxylic acids are acids, they lose protons.
Carboxylic acids react with bases, metals and carbonates just like other acids.

water produced

hydrogen gas produced

carbon dioxide gas produced



propanoic acid

propanoate ion

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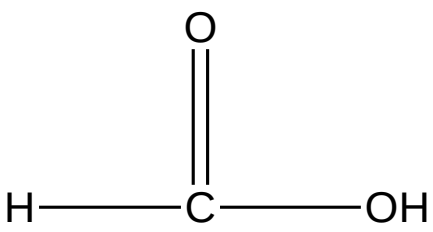
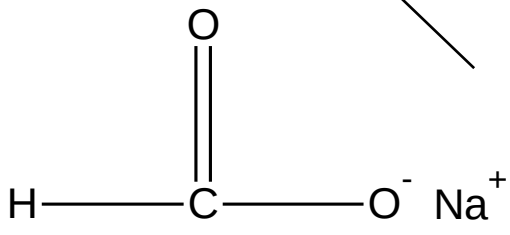
Reactions of carboxylic acids

Carboxylic acids can react with carbonates to form water, carbon dioxide and an ionic salt.

acid + metal carbonate ⟶ water + carbon dioxide + salt



+ Na_2CO_3 ⟶



+ H_2O + CO_2

fizzing/bubbles

methanoic acid

HCOOH

sodium methanoate

HCOONa

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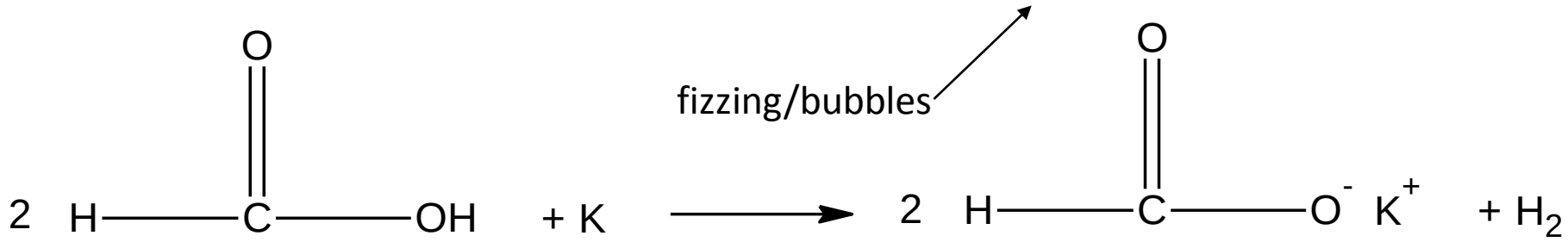
Reactions of carboxylic acids

Carboxylic acids can react with metals to form hydrogen gas and an ionic salt.

acid + metal ⟶ hydrogen gas + salt



methanoic acid

HCOOH

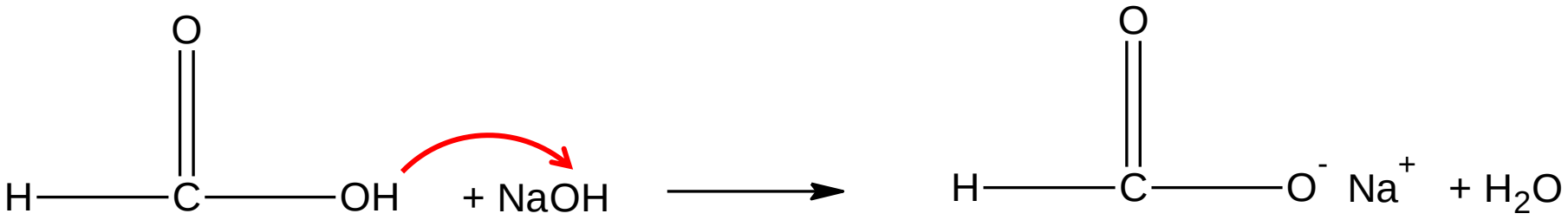
potassium methanoate

HCOOK

Reactions of carboxylic acids

Carboxylic acids can react with bases (alkali's) to form water and an ionic salt.

acid + base ⟶ water + salt



methanoic acid

HCOOH

sodium methanoate

HCOONa

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Reactions of carboxylic acids

Carboxylic acids can react with amines to form an ionic salt.

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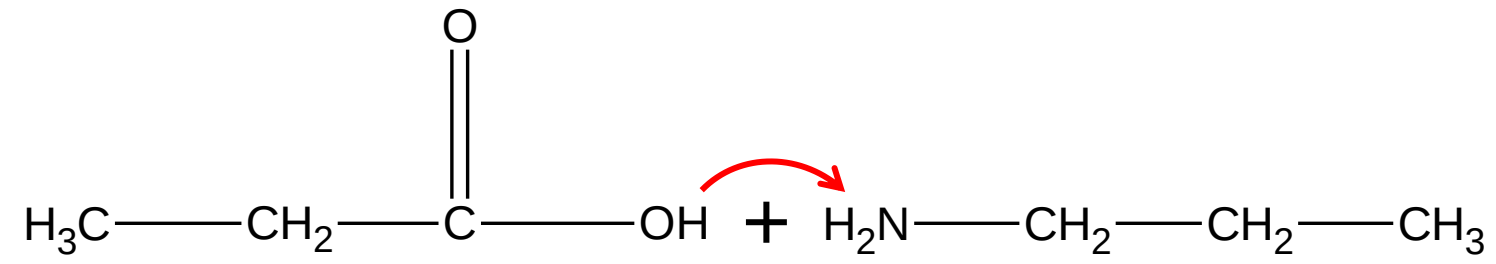
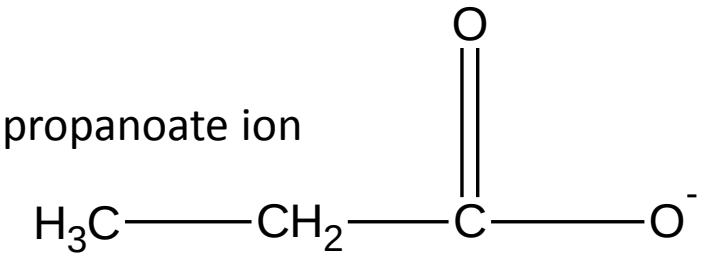
carboxylic acid + amine ⟶ organic salt

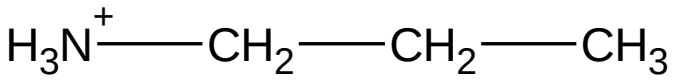


propanoic acid

propanamine



propanoate ion



propylammonium ion

Do now:

Draw and then name the following products from these reactions. If there are two products draw and name the major product.