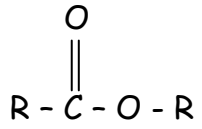
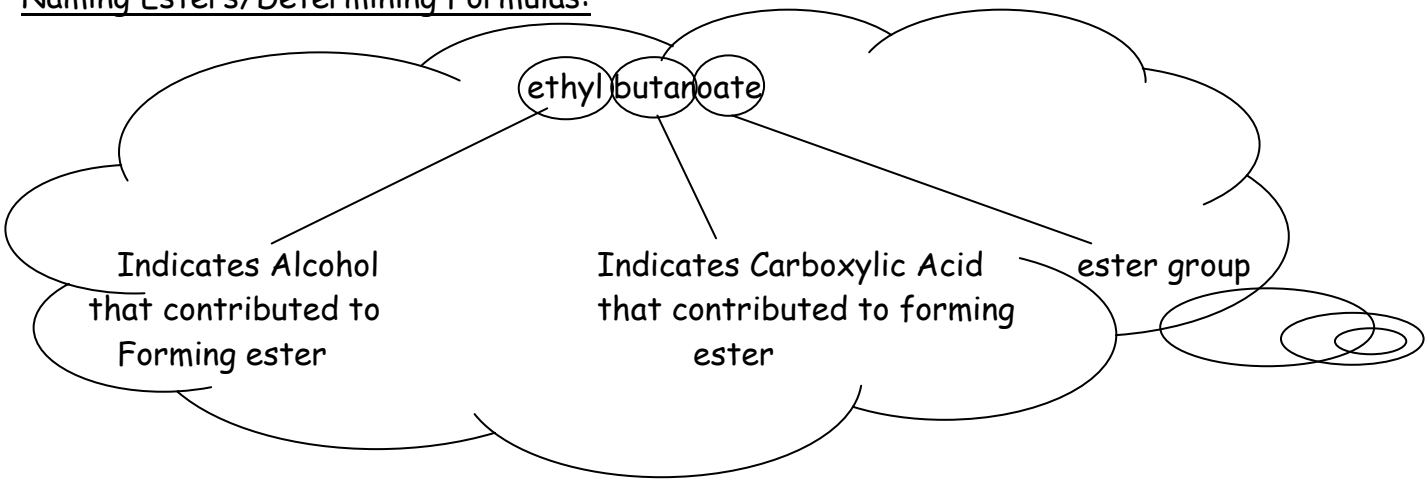
Esters

Esters take the general form of:



An ester is an organic compound that contains a carbonyl group (= O) bonded to an oxygen atom. It is formed when a carboxylic acid reacts with an alcohol. A reaction in which an ester is formed is called esterification. These reactions are usually condensation reactions. Esters are written in condensed structural diagrams as – COO -

<u>Naming Esters/Determining Formulas:</u>



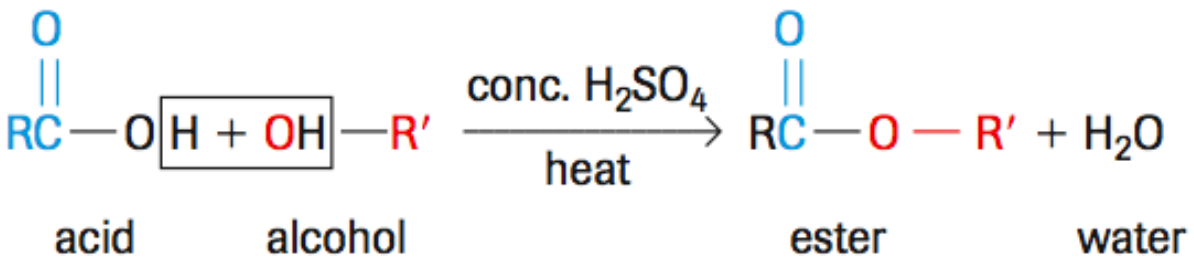
similar to keytones, the O bond can have alkane chains on both sides, the smallest chain is named first, followed by the longer chain

<u>Properties of esters:</u>

- similar to carboxyl group, but lack hydroxyl group
- less soluble in water, have lower boiling and melting points than corresponding carboxyl molecules
- are not acidic
- smaller esters (in terms of # of carbons) are gasses at room temperature and can be easily detected by their scent
- longer (and ∴ heavier) esters are waxy solids

Esterfication or Condensation Reactions:

Esters are formed when a carboxylic acid reacts with an alcohol. Any reaction when an ester is formed is called esterfication. In a condensation reaction a larger molecule is formed and a smaller molecule (eg. Water) is released. Often an acid catalyst and heat are generally required for the reaction to occur.



Hydrolysis Reactions:

Esterfication can be reversed. An ester is broken into its component parts of alcohol and a carboxylic acid. A strong base (Sodium Hydroxide) is required for a hydrolysis reaction. The sodium salts that result are generally known as 'soap'.