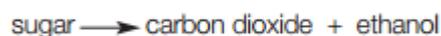


Ethanol – can be produced in 2 ways

- Ethanol can be produced by hydration of ethene with steam in the presence of a catalyst.
- Can be produced by fermentation with yeast, using renewable sources.



Vegetable oils

- Some fruits, seeds and nuts have oils which can be extracted.
- The plant material is crushed and then the oil is removed by pressing, like olive oil, or in some cases distillation, where water and other impurities are removed, like sunflower oil.
- Vegetable oils are important food and fuels as they provide a lot of energy. They also provide us with nutrients.
- Vegetable oils have higher boiling temperatures than water so can be used to cook foods at higher temperatures than by boiling. This produces quicker cooking and much different flavours but increases the energy that is released when it is eaten.

Emulsions

- Emulsifiers = substances which stabilise emulsions and stop them from separating out
- Oils do not dissolve in water, they can be used to produce emulsions.
- Emulsions are thicker than oil or water and have many uses depending on their special properties.
- They provide better texture, coating abilities and appearance, for example in salad dressings, ice creams, cosmetics and paints.
- Emulsifier molecules have a hydrophilic head 'water loving, oil hating', and a hydrophobic tails 'water hating, oil loving'
- The hydrophilic head dissolves in water, and the hydrophobic tail dissolves in oil, meaning that water and oil droplets can't separate out.

Saturated and unsaturated oils

- Vegetable oils that are unsaturated contain double bonds.
- Unsaturated oils and double bonds are detected by bromine water, the bromine water goes colourless when mixed when an unsaturated vegetable oil.
- **Vegetable oils that are unsaturated can be hardened by reacting them with hydrogen in the presence of a nickel catalyst at about 60 °C.**
- **Hydrogen adds to the carbon-carbon double bonds.**