

## SL & HL Questions on Alkenes

1. State the equation and name the organic product when propene reacts with:
  - i. hydrogen using a nickel catalyst at 180 °C.
  - ii. chlorine gas in the absence of water.
2. Describe how you could distinguish practically between hexane and hex-3-ene by using a simple chemical reaction. Describe what you would observe in each case and state any relevant equations and name any products formed.
3. Ethanol is increasingly being produced commercially by the fermentation of crops in order to use as a biofuel in place of/in addition to gasoline (petrol). This is ecologically friendly in terms of greenhouse gas emissions but it is using up vast areas of land which could be used for food production.  
Ethanol can also be made industrially by the hydration of ethene. State the equation for the hydration of ethene.
4.
  - i. State the equation and name the organic product when but-2-ene reacts with hydrogen iodide.
  - ii. Unlike the reaction with but-2-ene, the reaction of but-1-ene with hydrogen iodide is not on the IB Core. This is because in theory it can give two different organic products although in practice only one of them is formed. Deduce the identity of the two possible products.
5.
  - i. Draw the structure of the repeating unit of poly(chloroethene).
  - ii. Deduce the structure of the repeating unit of poly(tetrafluoroethene).
  - iii. Poly(tetrafluoroethene) is also known as 'Teflon' or 'non-stick' and it is used to make artificial joints for humans as well as coat frying pans. Suggest a reason why it is so unreactive.