

Chemguide – questions

ALKENES: EPOXYETHANE

- Epoxyethane is manufactured from ethene by reacting it with oxygen over a silver catalyst at temperatures between 250 – 300°C and a pressure of about 15 atmospheres.
 - Write the equation for the reaction, showing clearly the structure of the epoxyethane.
 - Why is it important to control the temperature during the reaction.
 - Explain how the structure you have drawn in the equation above contributes to the reactivity of epoxyethane.
- Write the equation for the acid catalysed reaction of epoxyethane and water, and name the product.
 - Give two uses for the product of this reaction.
- (Be sure you need to know about this before you get bogged down in what is a fairly tedious bit of chemistry!)

Epoxyethane reacts with alcohols such as ethanol in a series of steps eventually producing quite big molecules.

- The first step involves this reaction between ethanol and epoxyethane:



Explain why the product molecule can also react with epoxyethane, and write the equation for that reaction.

- The product molecule of that reaction can also react with epoxyethane. Write the formula of the product molecule of this reaction.
- If this process was done starting with a more complicated molecule, after a series of similar steps, you could end up with the product:



- Write the formula for the alcohol that you would have started with.
- Give a use for compounds of this type.