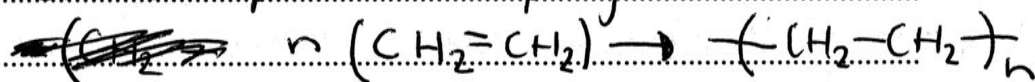


Question 30 (8 marks)

ethene. - glucose.

- (a) Compare the process of polymerisation of ethylene and glucose. Include relevant chemical equations in your answer. 3

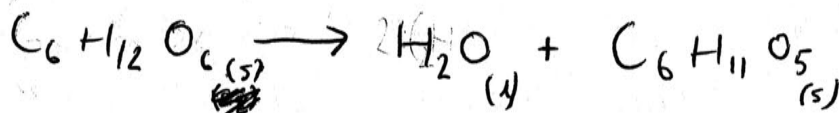
Polymerisation is a reaction where small monomer units join together to form a chain. The polymerisation of ethene produces polyethene.



This polymerisation is called addition polymerisation. The double bond is broken and opens up to form a chain. It has three stages: initiation, propagation and termination.

Question 30 continues on page 22

In contrast the polymerisation of glucose is a condensation reaction. In this reaction the small molecule of H<sub>2</sub>O condenses out as the polymer chain forms.



Question 30 (continued)

- (b) Explain the relationship between the structures and properties of THREE different polymers from ethylene and glucose, and their uses. 5

The structure of a polymer is linked to the chemical properties that the polymer ~~posses~~ has.

~~Structure 1~~ ① Styrene (ethylbenzene).

This polymer has added to it ~~a~~ large, rigid benzene ring.



The addition of the benzene ring makes the polymer a hard petrochemical. It is therefore used as the hard plastic that covers CD cases.

② Polyethylene.

Low density polyethylene consists of long unbranched ~~long~~ polymer chains

End of Question 30

This property makes the polymer very smooth as the ~~molecules~~ polymer molecules can easily move across each other. Consequently, LDPE is used as plastic wrap and in supermarket plastic bags.

③ PVC (poly vinyl chloride).

In PVC, the addition of the ~~big~~ chlorine atoms creates a hard ~~rigid~~ plastic. However, the chlorine makes it vulnerable to UV ~~of~~ degradation. Consequently UV inhibitors are added and the polymer can be used for outdoor uses such as guttering and rain downpipes.