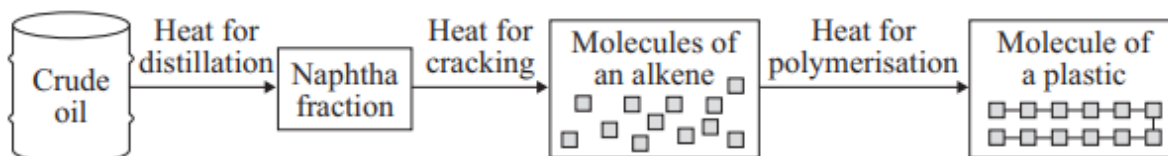


POLYMERS 5

Q1. Crude oil is used to make plastics.

To make a plastic from crude oil involves many processes.



(i) How do alkene molecules form a molecule of a plastic?

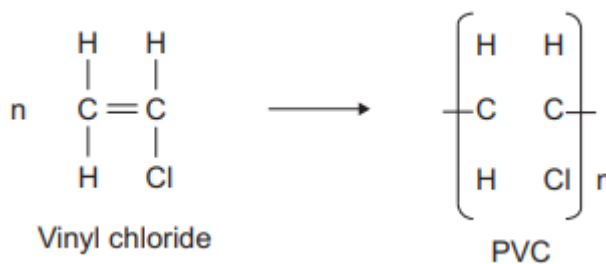
(1 mark)

(ii) Suggest one of the main costs of making a plastic from crude oil.

(1 mark)

Q2. Polymerisation of vinyl chloride produces polyvinyl chloride (PVC).

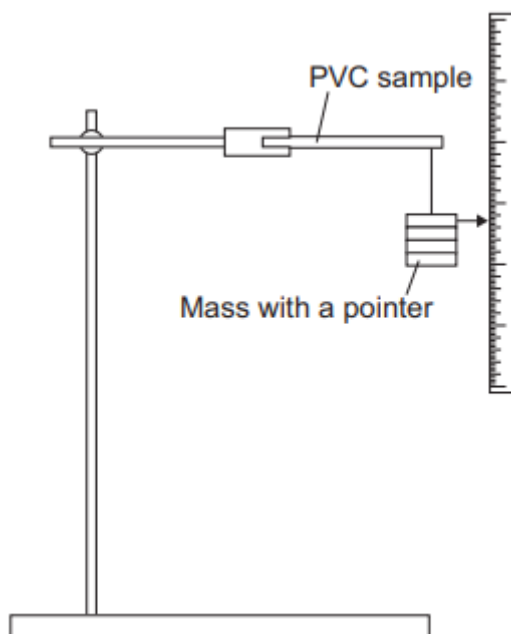
(a) Complete the chemical equation by drawing in the missing bonds of the product, PVC.



(1 mark)

- (b) Unplasticised polyvinyl chloride (uPVC) is used to make door and window frames. PVC with a plasticiser added is used to make cling film for wrapping food. A plasticiser is a chemical compound. A student investigated how the percentage of plasticiser added to PVC affected its flexibility.

The student measured the bending of PVC samples when a mass was added.



The student's results are shown in the table.

Sample of PVC	Percentage (%) of plasticiser added	Bending of PVC sample in mm				
		Test 1	Test 2	Test 3	Test 4	Mean
A	0	2	3	3	4	3
B	5	22	15	23	24	
C	10	27	27	29	29	28
D	15	34	35	35	36	35

- (i) Each PVC sample should be the same size to make it a fair test. Explain why.

(1 mark)

(ii) The student repeated the test four times for each sample. Explain why.

(1 mark)

(iii) Calculate the mean value for sample B.

(2 marks)

(iv) Each of the samples bent the most in test 4.

Suggest a possible reason for this.

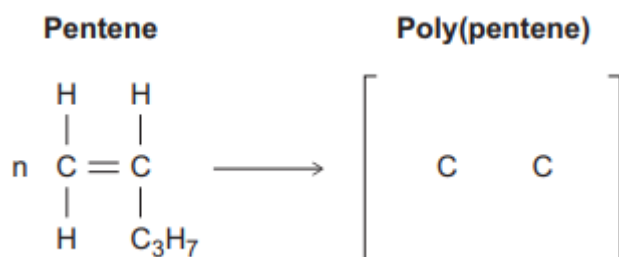
(1 mark)

Q3. Describe how molecules of butene (C_4H_8) form poly(butene).

(2 marks)

Q4. Pentene is used to produce poly(pentene).

Complete the equation and the displayed structure of poly(pentene).



(3 marks)

Q5. Poly(ethene) molecules are made from ethene molecules by a polymerisation reaction. Describe what happens in a polymerisation reaction.

(2 marks)

Total marks (15)