

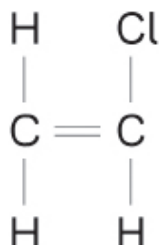
All questions are for separate science students only

Q1.

This question is about polymers.

Chloroethene can be used to produce an addition polymer called poly(chloroethene).

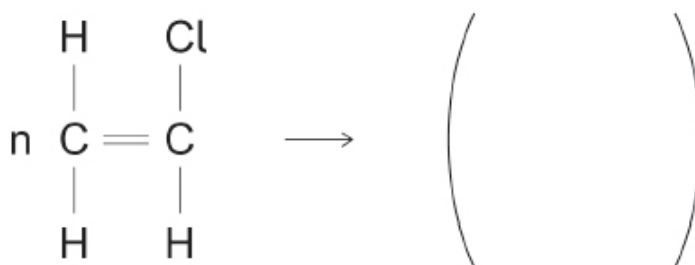
The displayed structural formula of chloroethene is



- (a) Draw a circle around the functional group on the displayed structural formula that allows chloroethene to produce an addition polymer. **(chemistry only)**

(1)

- (b) Complete the equation for the production of poly(chloroethene) from chloroethene. **(chemistry only)**

**(3)**

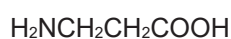
- (c) Poly(ethene) can be strengthened with wood particles to make a building material.

The building material consists of a wood particle reinforcement embedded in a poly(ethene) matrix.

What general name is given to materials like this? **(chemistry only)**

(1)

- (d) The amino acid beta-alanine has the formula



Beta-alanine polymerises to produce a polypeptide and a small molecule.

Name the small molecule produced when beta-alanine polymerises. **(chemistry only) (HT only)**

(1)

- (e) An amino acid can be represented as:



The relative formula mass (M_r) of this amino acid is 75

Calculate the relative formula mass of the section of this amino acid molecule represented by



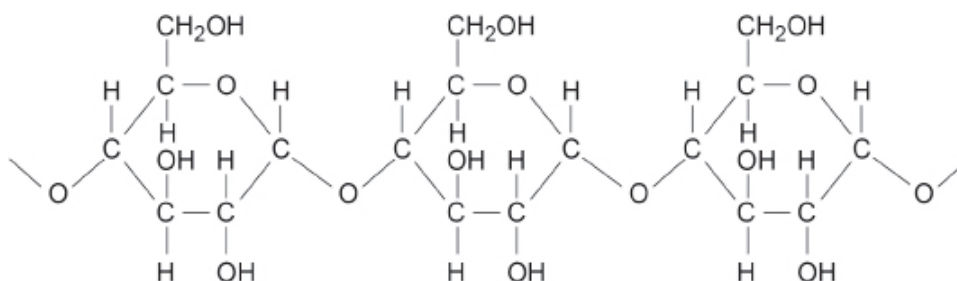
Relative atomic masses (A_r): H = 1 C = 12 N = 14 O = 16 (chemistry only)
(HT only)

Relative formula mass = _____

(2)

Figure 1 represents part of a naturally occurring polymer molecule produced from glucose.

Figure 1



- (f) Draw a circle around the repeating unit in the polymer in **Figure 1**. (chemistry only)

(1)

- (g) Suggest the identity of this polymer. (chemistry only)

(1)

Figure 2 represents the structure of a naturally occurring polymer.

Figure 2



- (h) Give the general name for the four different monomers which make up the structure shown in **Figure 2**. **(chemistry only)**

(1)

- (i) Name the **shape** of the structure shown in **Figure 2**. **(chemistry only)**

(1)

(Total 12 marks)