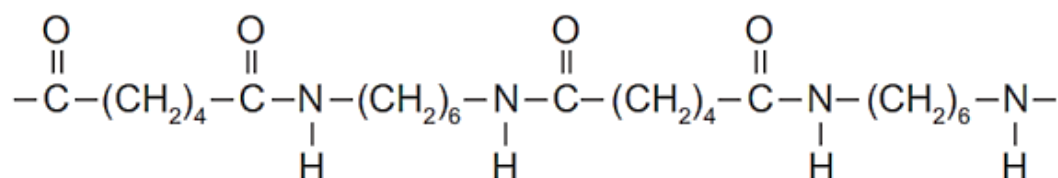


MINISTRY OF EDUCATION
SECONDARY ENGAGEMENT PROGRAMME
GRADE 11
CHEMISTRY

WEEK 13

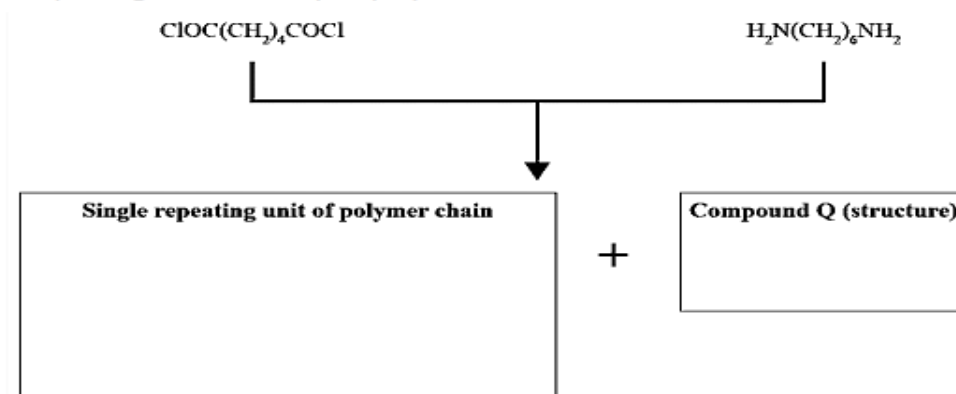
LESSON – WORKSHEET

1. Nylon 6,6 is a polymer with the following structure:

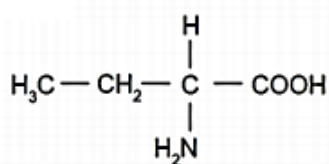


- (a) Circle an amide linkage in the structure above.
- (b) Draw TWO monomers that could have formed this polymer.
- (c) Nylon 6 is formed from the monomer $\text{H}_2\text{N} - (\text{CH}_2)_5 - \text{CO}_2\text{H}$.
- (i) Name this monomer.
- (ii) Draw THREE repeating units of the Nylon 6 polymer chain.

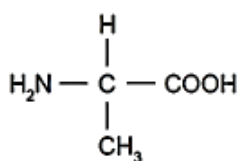
2. Draw a single repeating unit for the nylon polymer formed.



3.



undergoes a condensation reaction with the following molecule



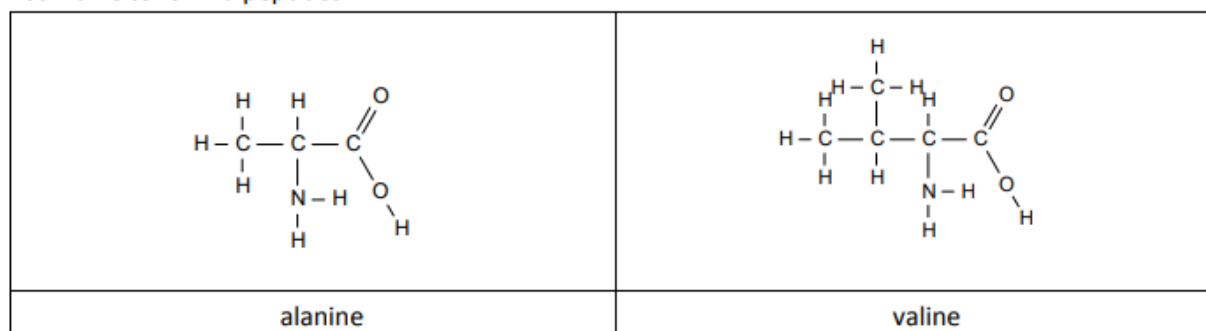
(commonly referred to as alanine).

It forms two different organic products referred to as dipeptides.

- Draw the structural formulae for the two possible dipeptides.
- Explain why the formation of dipeptides is referred to as a 'condensation reaction'.

4.

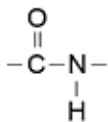
Amino acids are the building blocks that make up proteins. Alanine and valine are amino acids which can combine to form dipeptides.



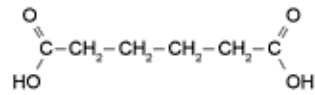
Draw the structure of a possible dipeptide formed from the combination of alanine and valine.

Answers

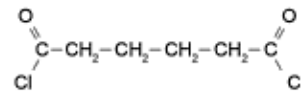
2011 (2)



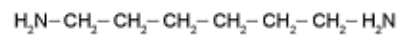
- (a) One link is circled.
(b) One set of monomers (can be in any order)



OR



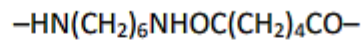
AND



- (c) (i) 6-amino hexanoic acid

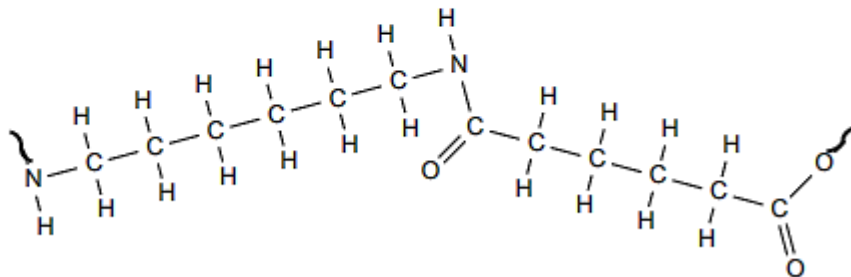
2.

Repeating unit is an amide linkage, ie



(dimer acceptable)

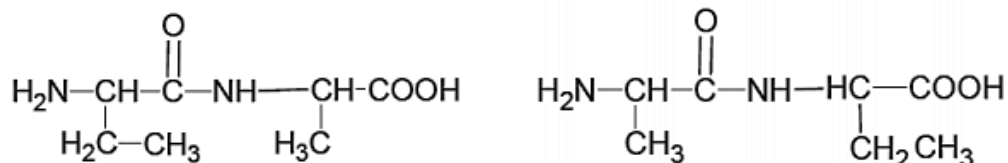
Or



3.

(e)

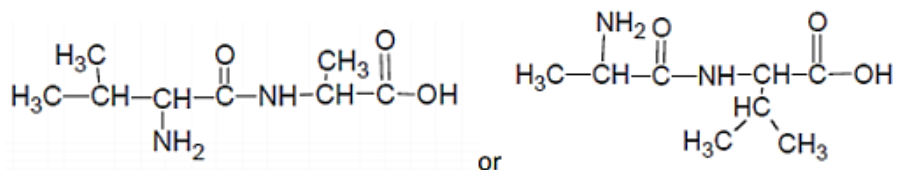
(i)



- (ii) Condensation reaction results in removal of a small molecule OR water during the bonding reaction between the 2 molecules, in this case a water molecule is produced for every peptide bond formed. The OH is removed from the carboxylic acid group/end and the H is removed from the amine group/end.

4

Amino acids are the building blocks that make up proteins. Alanine and valine are amino acids which can combine to form dipeptides.



Additional explanation

Redraw each monomer so $\text{H}_2\text{N}-\text{X}-\text{COOH}$ and $\text{H}_2\text{N}-\text{Y}-\text{COOH}$ then lose a molecule of water from $-\text{OH}$ of $-\text{COOH}$ on one molecule and $-\text{H}$ of $\text{H}_2\text{N}-$ of other, forming an amide link.

NOTE: Because the two amino acids were different you can form 2 different dipeptides; 2! (2x1).