

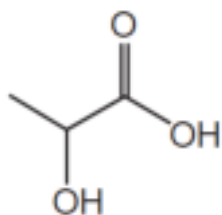
A level Chemistry B

H433/03 Practical skills in chemistry

Question Set 9

- 1 (a) A student taking A level chemistry and biology was researching the use of polymers in medicine. These are sometimes called biopolymers.

The student found that one of the most frequently used biopolymers is polylactic acid, PLA. PLA is made from lactic acid



Lactic acid

Lactic acid is a chiral molecule.

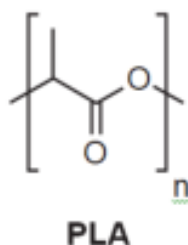
Explain the term **chiral** in this context and use 3-D structures to help your explanation.

Explanation.....
.....

Structures

[3]

- 1 (b) (i) The structure of PLA is shown below.



PLA has a wide variety of uses. One use is in biodegradable medical devices (e.g. screws and plates that are expected to biodegrade within 6–12 months).

Name the functional group in PLA and suggest the **type** of reaction that occurs when PLA biodegrades.

[2]

- 1 (ii) State the strongest type of intermolecular bonding that occurs between PLA polymer chains.

[2]

Explain, in terms of electronegativity, how this intermolecular bonding arises.

1 (c) The industrial manufacture of PLA uses heterogeneous catalysts.

A simple model of heterogeneous catalysis has four steps.

Describe the four steps involved.

1.....

2.....

3.....

4.....

[2]

Total Marks for Question Set 9 = 9

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