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VCE Chemistry ½

Condensation Polymers & Properties of Polymers [2.10]

Test

20 Marks. 1 Minute Reading. 12 Minutes Writing.

Results:

Quiz Questions	_____ / 15
Additional Questions	_____ / 5

Section A: Quiz Questions (15 Marks)

Question 1 (4 marks)

Tick whether the following statements are **True** or **False**.

Statement	True	False
a. Polymers with longer chains having more dispersion forces means that they are generally much stronger.		
b. Polymers which have branches will have more atoms than those without branches, resulting in more dispersion forces and greater intermolecular forces.		
c. Polychloroethene not only has dispersion forces but only can form dipole-dipole bonds with itself.		
d. Thermosetting polymers are typically weak, as they only have weak forces between the polymer layers, allowing them to be flexible.		
e. Thermoset polymers have polymer cross-links between the polymer chains, which are types of ionic bonds.		
f. Elastomers can be thought of as a mixture between a thermosetting and a thermoplastic polymer.		
g. HDPE has more branches than LDPE.		
h. Milk cartons would typically be made from HDPE, whereas plastic shopping bags would usually be made from LDPE.		

Space for Personal Notes

Question 2 (7 marks)

Harry is investigating two different types of thermosetting polymers. The first is made from the monomer ethene.

a. Draw the polymer made from this molecule. Provide the name of the molecule. (1 mark)

b. Explain how Harry would physically be able to distinguish between a thermoset or thermoplastic polymer. (1 mark)

c. What would be the difference in strength of a thermoset polymer with 10 monomer units versus a thermosetting polymer with 5 monomer units? (2 marks)

d. Another monomer which Harry considers using is fluoroethene. Draw the polymer of tetrafluoroethene. (1 mark)

e. Explain whether tetrafluoroethene would be soluble in water. (2 marks)

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Question 3 (4 marks)

While on a trip to the grocery store, Derrick is trying to identify what different compounds in the store are made of.

a. Derrick finds a hard, opaque, and inflexible plastic used to form a bucket. Would this be made of a thermoplastics or thermoset polymers? (1 mark)

_____

_____

b. What is the difference in molecular structure of thermoset versus thermoplastics? (2 marks)

_____

_____

_____

c. Derrick walks by the water aisle and is reminded of condensation reactions. Explain what a condensation polymer is, with reference to an example. (1 mark)

_____

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Section B: Additional Questions (5 Marks)

Question 4 (5 marks)

Bioplastics are a type of plastic which are sourced from renewable resources such as biomass and is being widely used to replace conventional plastics.

a. What is the main difference between the polymerisation of bioplastics versus fossil fuel plastics? (1 mark)

_____

b. Alongside these changes, governments have also mandated the use of recycling codes on different plastics, such as the ones pictured below.

What do codes 1-4 stand for? (2 marks)

_____

_____

_____

_____

c. What is the difference between chemical and mechanical recycling? (1 mark)

_____

_____

d. What is needed for organic recycling? (1 mark)

_____

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