Chemistry

Higher level

Paper 2

Practice paper

Topic: Models to Materials (HL)

1. Condensation polymers are formed via nucleophilic substitution at the carbonyl group.

(a) Identify the monomers required to produce Nylon 6,6 and draw their structures. **[4]**

(b) Illustrate the formation of the amide bond, showing the loss of the water molecule. **[3]**

2. Terylene (PET) is the most common polyester used in clothing.

(a) Write the equation for the formation of one repeating unit of Terylene from its monomers. **[3]**

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(b) Deduce one industrial use of PET and explain how its physical properties (e.g. thermal stability) suit this application. **[2]**

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3. The physical properties of a metal can be tailored by creating interstitial or substitutional alloys.

(a) Distinguish between interstitial and substitutional alloys, providing a specific example of each. **[4]**

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(b) Explain why Steel is significantly less ductile than pure Iron. **[2]**

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4. The degradation of materials is a major environmental concern.

(a) Compare the degradability of addition polymers (like polyethene) with condensation polymers (like polyamides) under environmental conditions. **[3]**

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(b) Discuss how 'microplastics' are formed and their impact on marine ecosystems. **[3]**

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