

**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]**

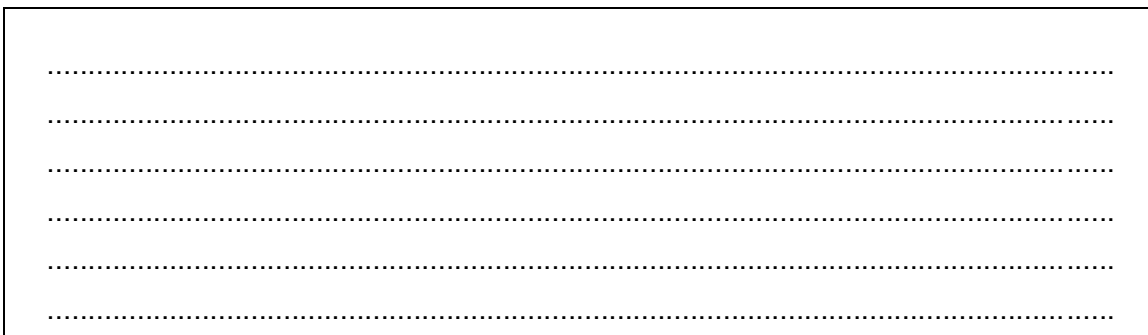


(b) Illustrate the formation of the amide bond, showing the loss of the water molecule. **[3]**



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]**



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

[2]

.....  
.....  
.....  
.....

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]

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

(b) Explain why Steel is significantly less ductile than pure Iron.

[2]

.....  
.....  
.....  
.....

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]

.....

.....

.....

.....

.....

.....

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

**[3]**

.....

.....

.....

.....

.....

.....