



# **A-Level Chemistry**

## **Polymers (Multiple Choice)**

### **Question Paper**

**Time available: 15 minutes**  
**Marks available: 14 marks**

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1.

Which polymer has hydrogen bonding between the polymer chains?

A Kevlar

B PVC

C poly(phenylethene)

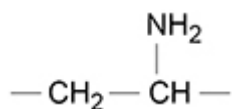
D Terylene

(Total 1 mark)

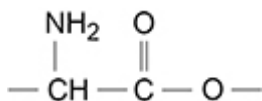
2.

Which is the repeating unit of a polyamide?

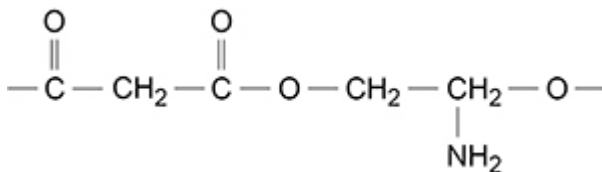
A



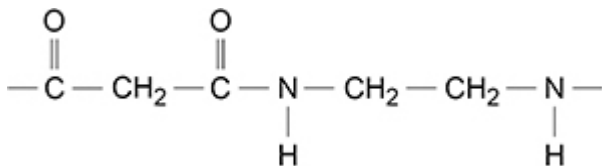
B



C



D



(Total 1 mark)

3.

Which forms a polymer with  $\text{ClOC}(\text{CH}_2)_8\text{COCl}$ ?A  $\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2$ B  $(\text{CH}_3\text{CO})_2\text{O}$ C  $\text{CH}_3\text{CH}_2\text{CONH}_2$ D  $\text{NH}_2\text{CH}_2\text{COOH}$ 

(Total 1 mark)

4. Which type of polymer is **not** hydrolysed by heating with concentrated aqueous sodium hydroxide?

A poly(alkene)

B poly(amide)

C poly(ester)

D protein

(Total 1 mark)

5. Which polymer has hydrogen bonding between its chains?

A Kevlar

B Polythene

C PVC

D Terylene

(Total 1 mark)

6. Which polymer is **not** hydrolysed when heated with aqueous alkali?

A Kevlar

B Nylon 6,6

C Poly(propene)

D Terylene

(Total 1 mark)

7. Terylene is made by reacting benzene-1,4-dicarboxylic acid and ethane-1,2-diol.

Terylene is

A an addition polymer.

B a polyamide.

C a polyester.

D a nylon.

(Total 1 mark)

8.

Suberoyl chloride,  $\text{ClOC}(\text{CH}_2)_6\text{COCl}$ , is commonly used in the manufacture of polymers.

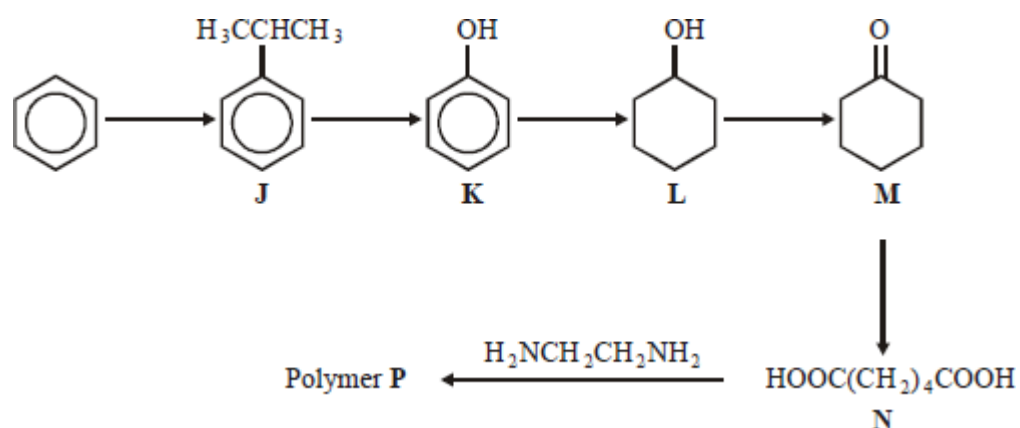
Which compound can form a polymer with suberoyl chloride?

- A  $\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$
- B  $\text{ClOCCH}_2\text{COCl}$
- C  $\text{CH}_3\text{CH}_2\text{CONH}_2$
- D  $\text{HOOCCH}_2\text{COOH}$

(Total 1 mark)

9.

This question is about the following reaction scheme which shows the preparation of polymer **P**.



Polymer **P** is formed in a two-step reaction from **N**. The first stage is a neutralisation reaction. The volume, in  $\text{cm}^3$ , of a  $0.20 \text{ mol dm}^{-3}$  solution of  $\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2$  required to neutralise  $6.8 \times 10^{-3} \text{ mol}$  of the acid **N** is

- A 17
- B 34
- C 68
- D 136

(Total 1 mark)

**10.**

Which compound can polymerise by reaction with itself?

- A  $\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2$
- B  $\text{CH}_3\text{CH}_2\text{CONH}_2$
- C  $\text{HOOCCH}_2\text{COOH}$
- D  $\text{NH}_2\text{CH}_2\text{COCl}$

**(Total 1 mark)****11.**

Which polymer is least likely to be biodegraded after several years in a landfill site?

- A Kevlar
- B Nylon
- C Polythene
- D Terylene

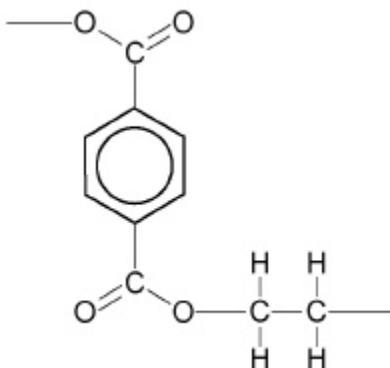
**(Total 1 mark)****12.**

Which compound can form a polymer without needing another reagent?

- A  $\text{HOCH}_2\text{CH}_2\text{OH}$
- B  $\text{HOOCCH}_2\text{CH}_2\text{COOH}$
- C  $\text{HOCH}_2\text{CH}_2\text{COCl}$
- D  $\text{ClCH}_2\text{CH}_2\text{COOH}$

**(Total 1 mark)**

13. The structure of part of a polyester chain is shown.



Which statement correctly explains why plastics made from this polyester only soften at high temperatures?

- A Hydrogen bonds and van der Waals' forces exist between polyester chains.
- B Permanent dipole-dipole forces and van der Waals' forces exist between polyester chains.
- C The carbon-carbon bonds in the chain are strong.
- D The carbon-oxygen bonds in the chain are strong.

(Total 1 mark)

14. The repeating unit of a polymer is shown.



Which monomer or pair of monomers could be used to make this polymer?

- A  $\text{ClOC}(\text{CH}_2)_4\text{NH}_2$  only
- B  $\text{ClOC}(\text{CH}_2)_4\text{COCl}$  only
- C  $\text{ClOC}(\text{CH}_2)_4\text{COCl}$  and  $\text{H}_2\text{N}(\text{CH}_2)_6\text{NH}_2$
- D  $\text{ClOC}(\text{CH}_2)_6\text{COCl}$  and  $\text{H}_2\text{N}(\text{CH}_2)_4\text{NH}_2$

(Total 1 mark)