InkChemistry

QUESTION WORKBOOK

Addition polymers

Alkenes and alcohols · Unit C18

AQA 3.3.4.3 · OCR A 4.1.3

19 questions · 56 marks

NAVY SCREEN EDITION

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SECTION A · Short, 1 to 2 marks

A1 AD-Q2 Name the monomers used to make PTFE and PVC. [2]

A2 AD-Q4 Identify the monomer of the polymer whose chain reads $-CH_2-CH(CN)-CH_2-CH(CN)-CH_2-CH(CN)-$. [2]

A3 AD-Q11 Suggest why PTFE is used to coat the inside of non-stick frying pans. [2]

A4 AD-Q17 Draw the repeating unit of the addition polymer formed from but-1-ene, $CH_2=CHCH_2CH_3$. [2]

A5 AD-Q19 Suggest why a photodegradable carrier bag may not break down once it has been buried in landfill. [2]

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A6 AD-Q21 Suggest how shredded poly(propene) could be separated from shredded PVC at a recycling plant, giving the reason it works. [2]

SECTION B · Standard, 3 to 5 marks

B1 AD-Q3 Calculate the number of repeating units in a poly(propene) chain of relative molecular mass 2.52×10^5, and give its repeating unit as a condensed formula with brackets and n. Mr of propene is 42.0. [4]

B2 AD-Q7 Explain why unplasticised PVC is more rigid than poly(ethene), and give one use of unplasticised and one of plasticised PVC, with the property that suits each. [4]

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B3 AD-Q1 Explain why the polymerisation of chloroethene is described as addition polymerisation, and why its atom economy is 100%. [3]

B4 AD-Q5 Explain why poly(ethene) is unreactive and does not biodegrade. [3]

B5 AD-Q6 Explain how adding a plasticiser to PVC makes it flexible. [3]

B6 AD-Q9 Calculate the mass of hydrogen chloride formed when 250 g of poly(chloroethene) is burned, assuming all the chlorine forms HCl. Mr of the repeating unit is 62.5 and Mr of HCl is 36.5. [3]

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B7 AD-Q10 Suggest why PVC waste should be incinerated only in plants fitted with gas scrubbers, and suggest a substance the scrubber could contain. [3]

B8 AD-Q13 Compare the bonding and the reactivity of ethene with those of poly(ethene). [3]

B9 AD-Q14 Describe how waste poly(propene) is recycled mechanically. [3]

B10 AD-Q16 Suggest why high-density poly(ethene) is chosen for milk bottles and low-density poly(ethene) for carrier bags. [3]

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B11 AD-Q18 Explain how building carbonyl groups into a poly(ethene) chain makes the polymer photodegradable. [3]

B12 AD-Q20 Calculate the energy released when 1.00 kg of ethene is polymerised, taking the enthalpy change of polymerisation as −82 kJ mol^{-1}. Mr of ethene is 28.0. [3]

SECTION C · Long, 6 marks or more

C1 AD-Q12 Evaluate the ways in which waste poly(ethene) and poly(chloroethene), PVC, can be dealt with after use, including feedstock recycling and burning for energy. [6]

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