

# Organic chemistry 2007 VCE

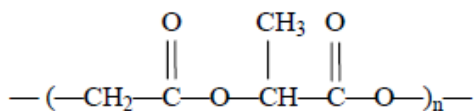
Which of the following statements would apply to compounds that belong to the same homologous series?

- I they have similar physical properties
  - II they have similar chemical properties
  - III they contain the same functional group
  - IV they have the same molecular formula but different structures
- A. III only  
B. IV only  
C. II and III only  
D. I, II, III and IV

Solution will appear here

Solution

Cuts and wounds are often stitched using a biodegradable polymer with the formula



It is made from a condensation polymerisation reaction between lactic acid ( $\text{HOCH}(\text{CH}_3)\text{COOH}$ ) and glycolic acid.

The formula of glycolic acid is

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

Solution will appear here

Solution

Ethene can be converted into other carbon-containing compounds using the reagents shown in the following flow chart.



Compounds X, Y and Z are, respectively

- A. bromoethane, ethanol, propyl ethanoate.  
B. bromoethane, ethanol, ethyl propanoate.  
C. bromoethene, ethanoic acid, ethyl propanoate.  
D. bromoethene, ethene hydroxide, propyl ethanoate.

Solution will appear here

Solution

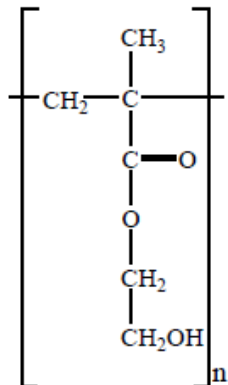
Reactions 1, 2 and 3 can be described as, respectively

- A. addition, addition, neutralisation.
- B. addition, substitution, condensation.
- C. substitution, neutralisation, oxidation.
- D. substitution, substitution, condensation.

Solution will appear here

Solution

The following structure represents the repeating unit of a polymer used in the manufacture of contact lenses.



Which one of the following is a correct statement about the monomers that react to form this polymer?

- A. Each monomer contains a double bond between carbon atoms which allows addition polymerisation to take place.
- B. Two different monomers react to form the polymer, one with carboxyl groups and the other with hydroxy groups.
- C. The total mass of the monomers is greater than the mass of the polymer formed because water is eliminated in the polymerisation reaction.
- D. Each monomer contains both a carboxyl and a hydroxy group which allows condensation polymerisation to take place, forming a polyester.

Solution will appear here

Solution

Parafin oil contains a mixture of high molecular mass alkanes. A gaseous mixture of ethene and other low molecular mass alkanes and alkenes can be produced in the laboratory by heating parafin oil in the presence of alumina.

a. i. What is the general name given to this process?

Solution

ii. Suggest the likely function of the alumina.

Solution

b. If one of the components of parafin oil is  $C_{17}H_{36}$ , write a balanced equation in which this component forms ethene and only one other product.

Solution

c. A chemist collects three samples of ethene and performs the following reactions. Write balanced equations for each one.

i. addition of bromine ( $Br_2$ )

Solution

ii. complete combustion

Solution

iii. heated with steam and a catalyst at  $300^\circ C$

Solution

Solution will appear here

A low molecular mass alkane was extracted from a gas sample obtained by this method. The following sequence of chemical reactions was then performed using this alkane.

□ The alkane was allowed to react with chlorine in the presence of ultraviolet light. Two compounds, A and B, were formed, each of molar mass  $78.5 \text{ g mol}^{-1}$ .

□ One of these two compounds was isolated and allowed to react with potassium hydroxide solution. The product of this reaction was heated with acidified potassium dichromate solution to form C, an acidic compound.

Solution will appear here

Draw the structural formulas of compounds A and B, showing all bonds present in the molecules. Give the systematic name of each compound.

[Solution](#)

Draw the structural formula of compound C, showing all bonds present in the molecule. Give the systematic name of the compound.

[Solution](#)

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