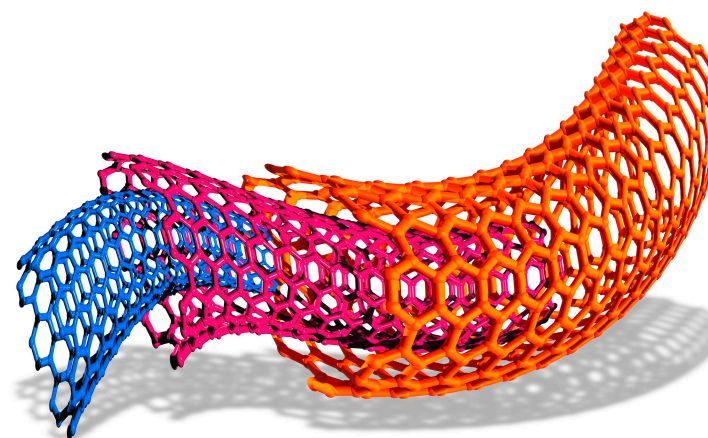


Interactive Example Candidate Responses

Paper 4 (May / June 2016), Question 6

Cambridge IGCSE™
Chemistry 0620



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6 Petroleum is a source of many important chemicals.

(a) Name **two** industrial processes which must take place to produce alkenes from petroleum.

Fractional Distillation, Cracking

[2]

(b) Ethene, $\text{CH}_2=\text{CH}_2$, and propene, $\text{CH}_2=\text{CHCH}_3$, can both be converted into polymers.

(i) What type of polymerisation takes place when ethene forms a polymer?

Addition Polymerisation

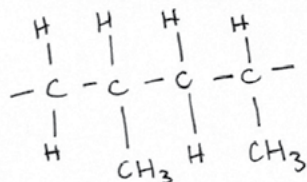
[1]

(ii) What is the empirical formula of the polymer formed from ethene?

[1]

(iii) Propene has the structural formula $\text{CH}_2=\text{CHCH}_3$.

Draw **two** repeat units of the polymer made from propene.

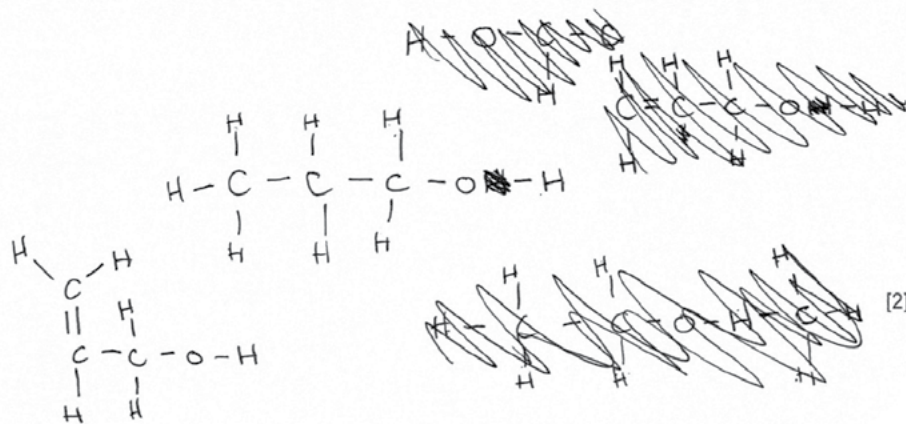


[2]

(c) Ethene will react with steam to form ethanol.

Propene will react with steam to form two isomers, both of which are alcohols.

Suggest the structures of these alcohols.



[2]

Select
page

Your
Mark

6(a)

6(b)(i)

6(b)(ii)

6(b)(iii)

6(c)

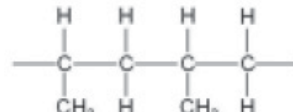
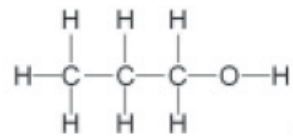
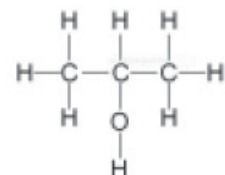
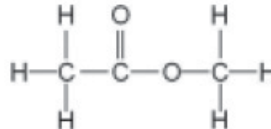
6(d)(i)

6(d)(ii)

6(d)(iii)

6(d)(iv)

Q6 Mark scheme

(a)	fractional distillation; cracking;
(b)(i)	addition;
(b)(ii)	CH_2 ;
(b)(iii)	 M1 chain of 4 carbon atoms with single bonds and continuation bonds; M2 correctly positioned CH_3 side chains;
(c)	 ;  ;
(d)(i)	(concentrated) sulfuric acid;
(d)(ii)	methyl ethanoate;
(d)(iii)	 M1 ester link; M2 rest of molecule;
(d)(iv)	terylene;

(d) Esters are organic chemicals noted for their characteristic smells. Ethanoic acid and methanol will react to form an ester.

(i) Name the catalyst needed to form an ester from ethanoic acid and methanol.

Copper

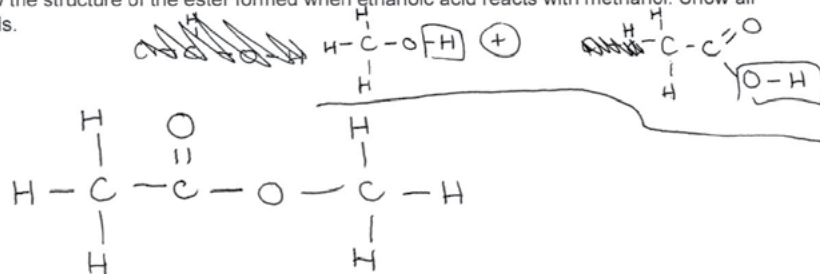
[1]

(ii) Name the ester formed when ethanoic acid reacts with methanol.

methyl ethanoate

[1]

(iii) Draw the structure of the ester formed when ethanoic acid reacts with methanol. Show all bonds.



[2]

(iv) Give the name of a polyester.

terylene

[1]

[Total: 13]

Your
Mark

6(a)

6(b)(i)

6(b)(ii)

6(b)(iii)

6(c)

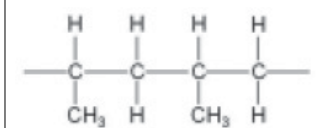
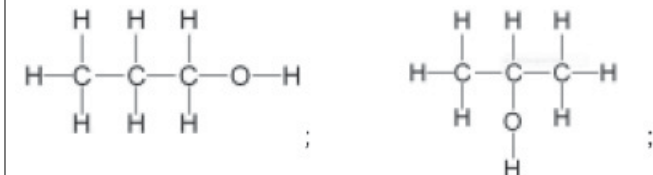
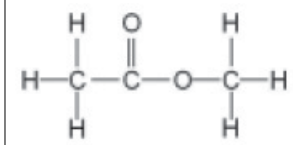
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6(d)(ii)

6(d)(iii)

6(d)(iv)

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(d)(iv)	terylene;

6 Petroleum is a source of many important chemicals.

(a) Name **two** industrial processes which must take place to produce alkenes from petroleum.

→ Burning of fossil fuel.

→ Extracting petroleum.

[2]

(b) Ethene, $\text{CH}_2=\text{CH}_2$, and propene, $\text{CH}_2=\text{CHCH}_3$, can both be converted into polymers.

(i) What type of polymerisation takes place when ethene forms a polymer?

Addition polymerisation.

[1]

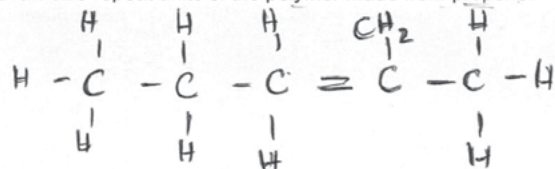
(ii) What is the empirical formula of the polymer formed from ethene?

~~C_2H_4~~ C_2H_2

[1]

(iii) Propene has the structural formula $\text{CH}_2=\text{CHCH}_3$.

Draw **two** repeat units of the polymer made from propene.

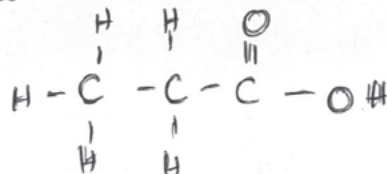


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[2]

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6(b)(iii)

6(c)

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6(d)(ii)

6(d)(iii)

6(d)(iv)

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(d)(iv)	terylene;

(d) Esters are organic chemicals noted for their characteristic smells. Ethanoic acid and methanol will react to form an ester.

(i) Name the catalyst needed to form an ester from ethanoic acid and methanol.

Sodium hydroxide.

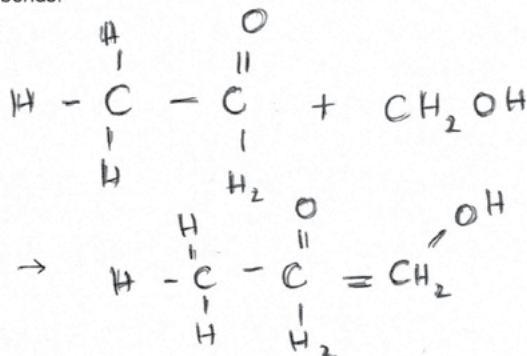
[1]

(ii) Name the ester formed when ethanoic acid reacts with methanol.

Methyl ethanoate.

[1]

(iii) Draw the structure of the ester formed when ethanoic acid reacts with methanol. Show all bonds.



[2]

(iv) Give the name of a polyester.

Nylon polyester.

[1]

[Total: 13]

Your
Mark

6(a)

6(b)(i)

6(b)(ii)

6(b)(iii)

6(c)

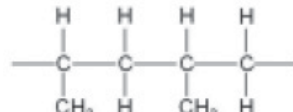
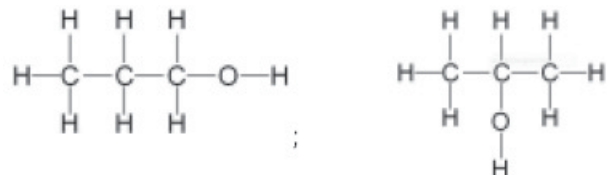
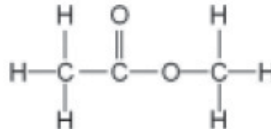
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Cambridge Assessment International Education
The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA, United Kingdom
t: +44 1223 553554
e: info@cambridgeinternational.org www.cambridgeinternational.org

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