

Unit 18: Carboxylic acids and derivatives

Subunit 18.2: Esters

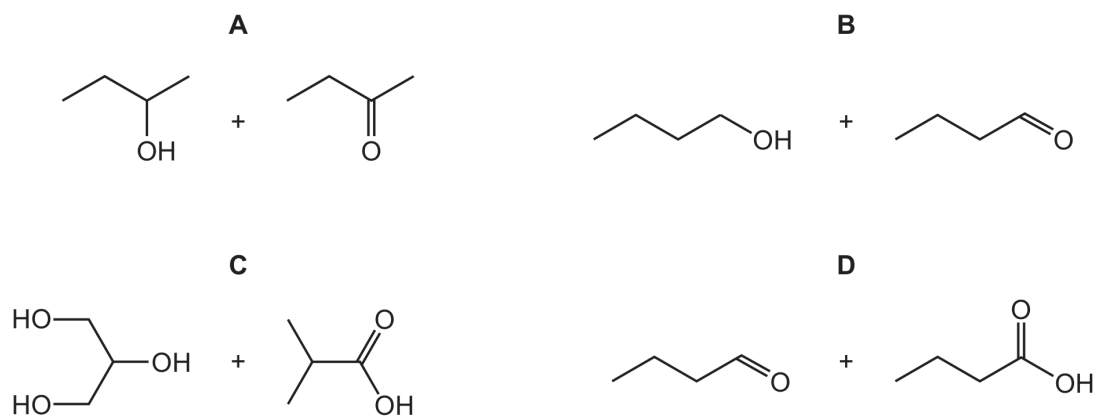
Topical Question No: 1

28 Which mixture could be used to produce propyl methanoate?

- A $\text{CH}_3\text{CH}_2\text{CO}_2\text{H}$ and CH_3OH
- B $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ and HCO_2H
- C $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ and HCO_2H
- D $\text{CH}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$ and CH_3OH

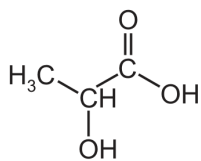
Topical Question No: 2

30 Which two compounds can react together to produce an ester?



Topical Question No: 3

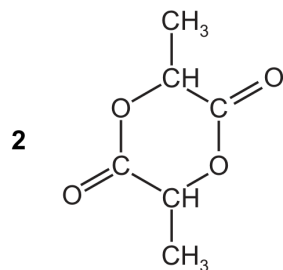
- 40 The structure of lactic acid is shown.



lactic acid

Which esters might form when lactic acid is heated?

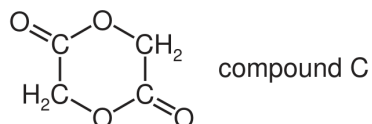
- 1 $\text{CH}_3\text{CH}(\text{OH})\text{CO}_2\text{CH}(\text{CH}_3)\text{CO}_2\text{H}$



- 3 $\text{CH}_3\text{CH}(\text{OH})\text{CO}_2\text{CH}(\text{OH})\text{CH}_3$

Topical Question No: 4

- 22 Compound C is used in textile and leather processing.



compound C

Which starting material(s), on gentle heating with a few drops of concentrated sulfuric acid, generates compound C?

- A CH_3COOH only
B HOCH_2COOH only
C $\text{CH}_3\text{COOCH}_2\text{COOH}$ only
D CH_3COOH mixed with HOCH_2COOH

Topical Question No: 5

- 23 How many isomeric esters have the molecular formula $\text{C}_4\text{H}_8\text{O}_2$?

- A 2 B 3 C 4 D 5

Topical Question No: 6

24 Use of the Data Booklet is relevant to this question.

A sample of ethyl propanoate is hydrolysed by heating under reflux with aqueous sodium hydroxide. The two organic products of the hydrolysis are separated, purified and weighed.

Out of the total mass of products obtained, what is the percentage by mass of each product?

- A 32.4 % and 67.6 %
- B 38.3 % and 61.7 %
- C 42.3 % and 57.7 %
- D 50.0 % and 50.0 %

Topical Question No: 7

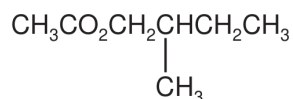
29 Compound Y has M_r of 88. It does not fizz when added to a solution of sodium hydrogencarbonate. It can be hydrolysed by dilute sulfuric acid to produce two organic products with M_r values of 46 and 60.

What is the identity of compound Y?

- A butanoic acid
- B ethyl ethanoate
- C 3-hydroxybutanal
- D butyl methanoate

Topical Question No: 8

22 An ester with an odour of banana has the following formula.



Which pair of reactants, under suitable conditions, will produce this ester?

- A $\begin{array}{c} \text{CH}_3\text{CH}_2\text{CHCH}_2\text{CO}_2\text{H} \\ | \\ \text{CH}_3 \end{array} + \text{CH}_3\text{OH}$
- B $\begin{array}{c} \text{CH}_3\text{CH}_2\text{CHCO}_2\text{H} \\ | \\ \text{CH}_3 \end{array} + \text{CH}_3\text{CH}_2\text{OH}$
- C $\text{CH}_3\text{CO}_2\text{H} + \begin{array}{c} \text{CH}_3\text{CH}_2\text{CHCH}_2\text{OH} \\ | \\ \text{CH}_3 \end{array}$
- D $\text{CH}_3\text{CO}_2\text{H} + \begin{array}{c} \text{CH}_3\text{CHCH}_2\text{CH}_2\text{OH} \\ | \\ \text{CH}_3 \end{array}$

Topical Question No: 9

38 The molecule responsible for the pineapple flavour used in sweets is $\text{CH}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{CH}_2\text{CH}_3$.

Which statements about this molecule are correct?

- 1** The name of this compound is ethyl butanoate.
- 2** This compound is a structural isomer of hexanoic acid.
- 3** When this compound is heated with aqueous sodium hydroxide, the products are butan-1-ol and sodium ethanoate.

Answer Key

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2. Error
3. Error
4. Error
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6. Error
7. Error
8. Error
9. Error