



CHEMISTRY ONLINE
— **TUITION** —

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CHEMISTRY

ORGANIC CHEMISTRY

Level & Board	AQA (A-LEVEL)
TOPIC:	ALKANES
PAPER TYPE:	SOLUTION - 3
TOTAL QUESTIONS	10
TOTAL MARKS	26

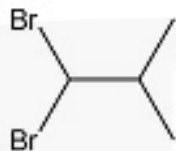
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Alkanes - 3

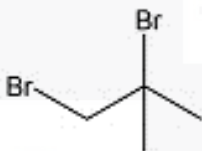
1.

(a)

Two of the branched chain isomers of $C_4H_8Br_2$ are as



$(CH_3)_2CHCHBr_2$ 1,1-dibromo-2-methylpropane



$(CH_3)_2C(Br)CH_2Br$

1,2-dibromo-2-methylpropane.

(4)

(b)

$C_4H_8Br_2$

Carbon (C):

$$(22.24/100) \times 215.8$$

$$= 47.99 \text{ g/mol}$$

This corresponds to $48/12$

= 4 carbon atoms.

Hydrogen (H):

$$(3.71/100) \times 215.8 = 8.01 \text{ g/mol}$$

This corresponds to $8/1$

= 8 hydrogen atoms.

Bromine (Br):

$$(74.05/100) \times 215.8$$

=159.8 g/mol

This corresponds to 159.8/79.9

=2 bromine atoms.

formula = $C_4H_8Br_2$

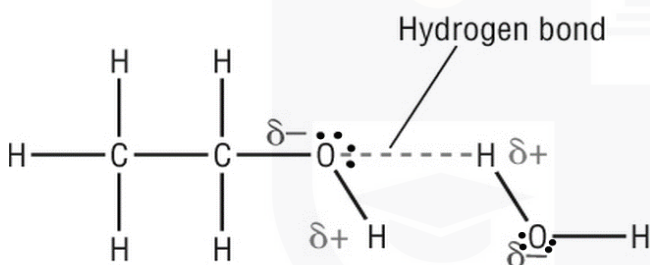
(3)

2. D

(1)

3.

Following diagram is showing one molecule of ethanol interacts with one molecule of water in the solution by hydrogen bonding.



(3)

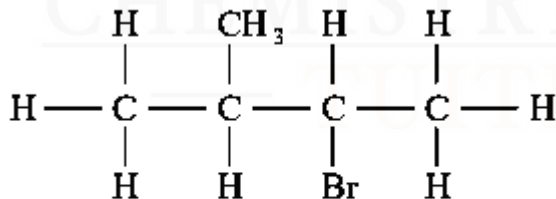
4. A

(1)

5.

(a)

Name of isomer: 2-bromo-3-methylbutane



isomer A

(2)

(b)

Structural isomers are compounds that share the same molecular formula but have different structural arrangements of atoms.

In these isomers, the connectivity of atoms or the spatial arrangement of functional groups varies, leading to distinct chemical structures. Despite having the same number and types of atoms, structural isomers have different physical and chemical properties due to their unique structural features.

(2)

6. C

(1)

7.

Heating and Vaporization:

Crude oil is heated, causing it to vaporize or boil.

Passage into Fractionating Column:

The resulting vapors are passed into a tall column or tower known as a fractionating column.

Condensation at Different Heights:

As vapors ascend the column, they gradually cool down due to the temperature gradient. Condensation occurs at different heights within the column due to variations in the boiling points of hydrocarbons.

Similar Molecules Condense Together:

Hydrocarbons with similar molecular sizes, boiling points, and masses condense together.

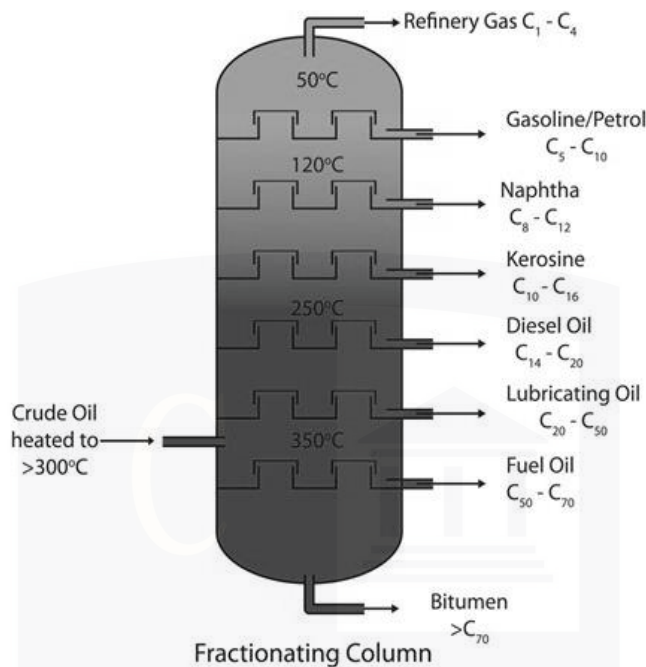
Fractionation by Molecular Size and Boiling Point:

Smaller molecules, characterized by lower boiling points, tend to condense at the top of the column, while larger molecules, with higher boiling points, condense at lower levels.

This separation allows for the collection of different fractions at distinct heights, each containing hydrocarbons with similar properties.

I am Sorry !!!!!

Crude Oil Fractional Distillation



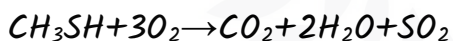
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8. D

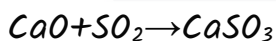
(1)

9.

Equation for the complete combustion of methanethiol:



As Calcium oxide reacts with sulfur dioxide to form calcium sulfite (CaSO₃), which is a solid product. That is why calcium oxide can be used to remove the sulfur-containing product of this combustion reaction.



One pollution problem:

Acid rain is formed when sulfur dioxide reacts with water vapor in the atmosphere, resulting in increased rusting of iron, harm to fish in lakes, and problems for individuals with asthma due to the consequences of acid rain.

(3)

10. D

(1)

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- Founder & CEO of Chemistry Online Tuition Ltd.
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