

# Alkanes

1. 1 mol of a compound reacts with 8 mol  $O_2$  for complete combustion.

What is the formula of the compound?

- A  $C_4H_8$
- B  $C_4H_9OH$
- C  $C_5H_{11}OH$
- D  $C_5H_{12}$

Your answer

[1]

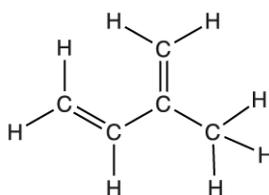
2. Which organic compound has the lowest boiling point?

- A 2,3,4-trimethylpentane
- B 2,3-dimethylhexane
- C 2-methylheptane
- D octane

Your answer

[1]

3. The displayed formula for a hydrocarbon is shown below.



How many  $\sigma$  and  $\pi$  bonds are present in a molecule of this hydrocarbon?

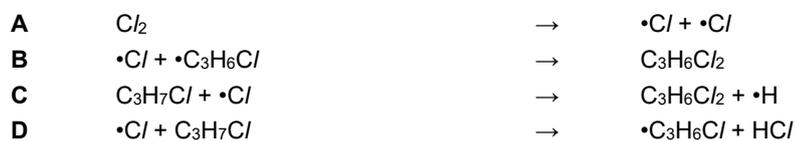
	$\sigma$ bonds	$\pi$ bonds
A	2	4
B	10	2
C	10	4
D	12	2

Your answer

[1]

4. Chlorine reacts with 1-chloropropane in the presence of ultraviolet radiation via a radical substitution mechanism.

Which equation shows a propagation step in the mechanism for this reaction?



Your answer

[1]

5. Which molecule has the highest boiling point?

- A. 2,3-dimethylbutane
- B. 2-methylheptane
- C. 2,3,4-trimethylpentane
- D. 3-ethylpentane

Your answer

[1]

END OF QUESTION PAPER

# Mark scheme - Alkanes

Question			Answer/Indicative content	Marks	Guidance
1			D	1	<p><b><u>Examiner's Comments</u></b></p> <p>Most candidates selected A or D, with D being the correct option. Presumably, A was chosen by halving the '8' in C<sub>4</sub>H<sub>8</sub> without considering that each H<sub>2</sub>O molecule contains two H atoms. The successful answer of D usually resulted from the candidate constructing equations.</p>
			<b>Total</b>	<b>1</b>	
2			A	1	<p><b><u>Examiner's Comments</u></b></p> <p>The majority of candidates correctly identified answer option A as the lowest boiling point alkane. The common incorrect answer was D, the complete opposite as it is the least branched and longest chain.</p>
			<b>Total</b>	<b>1</b>	
3			D	1	<p><b><u>Examiner's Comments</u></b></p> <p>B was a common incorrect answer with the sigma bond not counted as part of a double bond.</p>
			<b>Total</b>	<b>1</b>	
4			D	1	<p><b><u>Examiner's Comments</u></b></p> <p>Generally scored well.</p>
			<b>Total</b>	<b>1</b>	
5			B	1	
			<b>Total</b>	<b>1</b>	