N5 Chemistry: Unit 2 – Nature's Chemistry REVISION

Lesson 12 – Alkenes, Isomers and Addition Reactions

Learning Outcomes

By the end of this lesson you should have revised:

1. How to draw, name and identify alkenes with no more than 8 carbons in the longest chain.
2. State and use general formulae.
3. Identify and draw isomers.
4. Identify and complete addition reactions.

Success Criteria

You will have been successful in this lesson if you:

1. Watch the links provided
2. Complete revision questions provided
3. Complete and submit homework assigned

There is also a further reading section to help you gain more depth of understanding for this section.

If you have any questions about the content of this lesson, you should ask your class teacher either through your class MS team or via email. MS Teams will be monitored throughout the week by a chemistry teacher. If you need help or clarification with either the task or the content of the lesson, just ask.

Links to Prior Knowledge

You may wish to revise the following to help you understand this lesson:

- N5 Unit 2: Homologous Series
- N5 Unit 3: Plastics

You do not need to copy any notes as this is all revision, but you should complete all questions and tasks as outlined in this document.

Watch these videos first:

Lesson 12a - Alkenes: https://youtu.be/dwRpkJitU88

Lesson 12b - Isomers: https://youtu.be/Iqi9ZnBw6eU

Lesson 12c - Addition Reactions: https://youtu.be/VDniyptoItI

You should also consult your Unit 2 Notes and printed notes to help further consolidate your knowledge.

Further Reading

To learn more about chemical analysis, try the following online resources:

BBC Bitesize: https://www.bbc.co.uk/bitesize/guides/zw4tw6f/revision/3

https://www.bbc.co.uk/bitesize/guides/zw4tw6f/revision/5

https://www.bbc.co.uk/bitesize/guides/zw4tw6f/revision/7

Scholar: Log in through GLOW

National 5 Chemistry → Nature's Chemistry →

4. Alkenes and 4.5 Reactions of Alkenes (4.5.1 Addition Reactions)

4.6 Isomers

Evans2 chem web: https://www.evans2chemweb.co.uk/

Username: snhs password: giffnock

Select any teacher → revision → National 5 → Unit 2 → Homologous Series

Complete the following questions in your class work jotter.
The answers will be posted on Teams later in the week.

Practice Questions – Alkenes, Isomers and Addition Reactions

1. State what is meant by the terms 'saturated' and 'unsaturated' (2)

2. State what is meant by the term isomers. (1)

3. State two uses for alkenes (1)

4. Draw the full structural formula for the following molecules:
   a. The unsaturated hydrocarbon with molecular formula C_3H_6.
   b. Two isomers with the molecular formula: C_5H_{10}
   c. Two isomers with the molecular formula: C_5H_{12} (3)

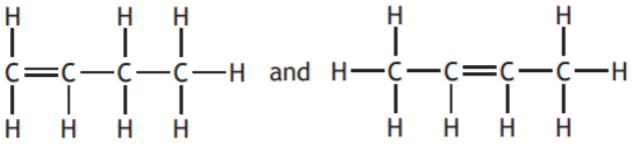
5. Name and draw the full structural formula for the products of each of the following reactions:

a) Where hex-2-ene undergoes a hydration reaction (both possible products) (4)
b) Where ethene undergoes a hydrogenation reaction. (2)
c) Where pent-1-ene reacts with bromine. (2)

Total: 15 marks

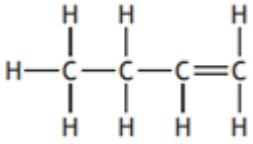
Past-Paper Questions – Alkenes, Isomers and Addition Reactions

1. Two isomers of butene are

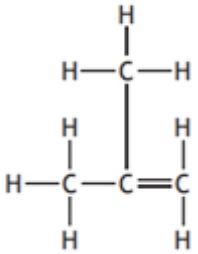


Which of the following structures represents a third isomer of butene?

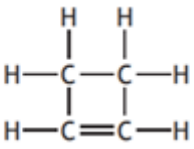
A



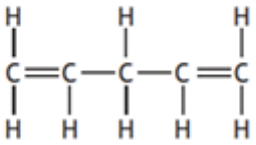
B



C



D



(1)

2. Which of the following compounds fits the general formula, C_nH_{2n}, and will rapidly decolourise bromine solution?

A Cyclopentane

B Cyclopentene

C Pentane

D Pentene (1)

(questions continue on the next page)

3. Which of the following could be the molecular formula for an alkane?

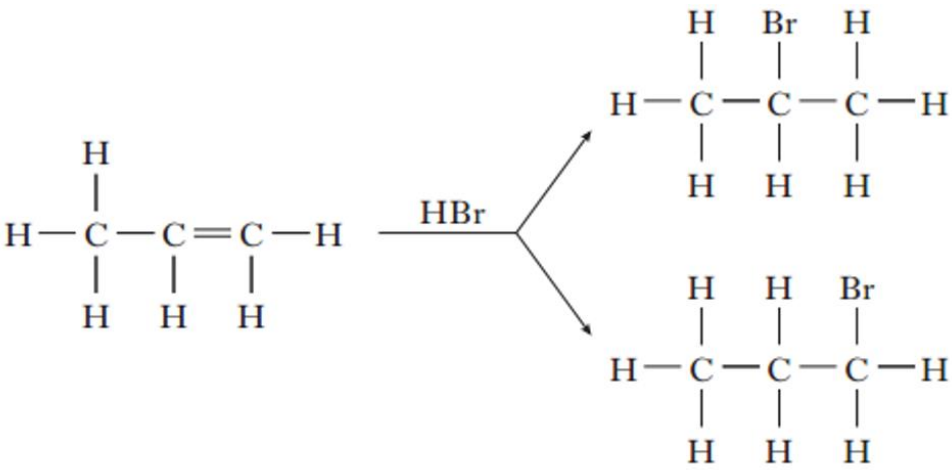
A C_7H_{16}

B C_7H_{14}

C C_7H_{12}

D C_7H_{10} (1)

4. Propene reacts with hydrogen bromide to form two products.



Which of the following alkenes does **not** form two products on reaction with hydrogen bromide?

A But-1-ene

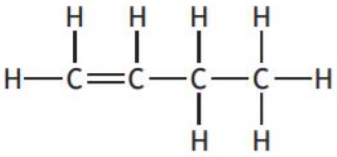
B But-2-ene

C Pent-1-ene

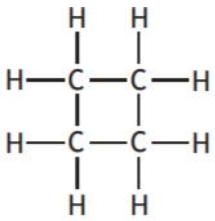
D Pent-2-ene (1)

(questions continue on the next page)

5. A student added bromine solution to compound X and compound Y.



Compound **X**



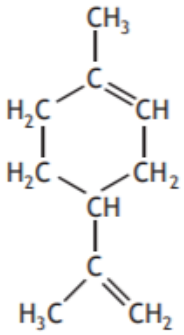
Compound **Y**

Which line in the table is correct?

	Decolourises bromine solution immediately	
	Compound **X**	Compound **Y**
A	no	no
B	no	yes
C	yes	yes
D	yes	no

(1)

6. Limonene, $C_{10}H_{16}$, is an essential oil which is added to some cleaning products to give them a lemon scent.



The concentration of limonene present in a cleaning product can be determined by titrating with bromine solution.

a) Name the type of chemical reaction taking place when limonene reacts with bromine solution. (1)

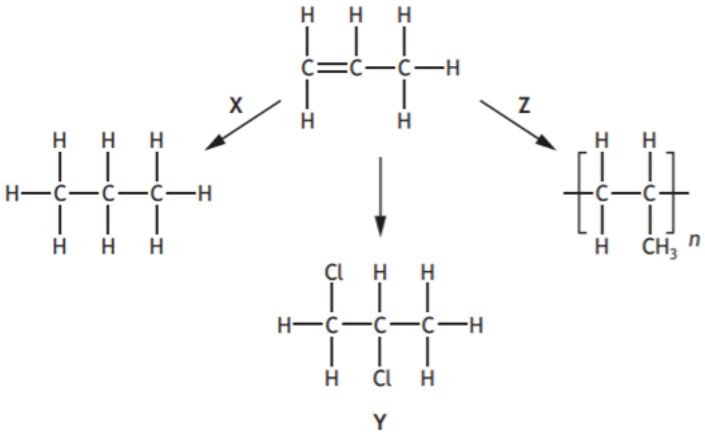
b) Write the molecular formula for the product formed when limonene, $C_{10}H_{16}$, reacts completely with bromine solution. (1)

(questions continue on the next page)

7. The alkenes are a family of unsaturated hydrocarbons.

a) Describe the chemical test, including the result, to show that a hydrocarbon is unsaturated. (1)

b) Propene is an alkene that can take part in a range of addition reactions.



i) Name the type of addition reaction taking place in reaction X. (1)

ii) Name the chemical that reacts with propene to form compound Y. (1)

Total: 10 marks