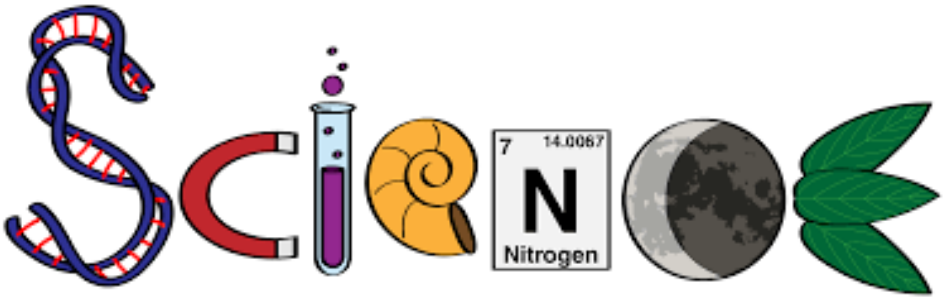
Meopham School




# HOMEWORK BOOKLET

## C7 & C8 Standard

Homework 1

# Fractional Distillation

Use the words in the box to complete the following;

_____ oil is a mixture of _____ which can all be used for different things. This ranges from oil for ships to _____ for cars and lorries, to tar which is used to surface roads. All the chemicals ____ at different temperatures. This mixture can be separated in a _____ column in a process called _____ _____.

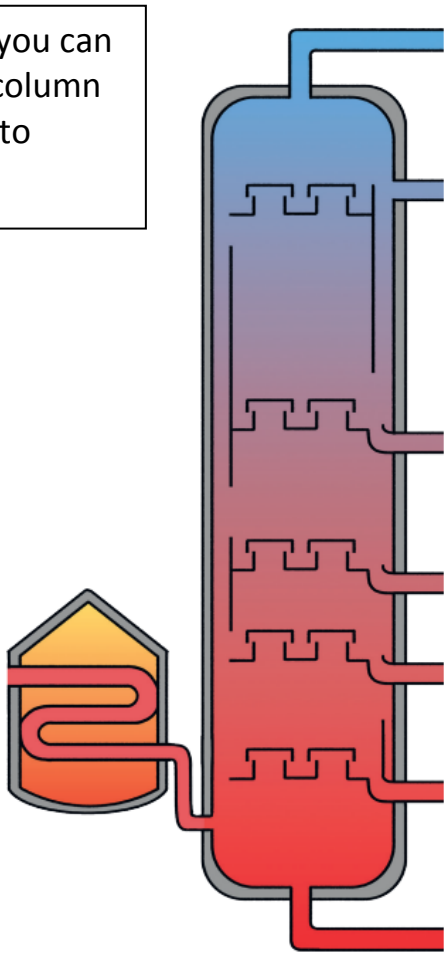
Crude oil is heated to about _____ – at this temperature most of the oil has _____ (turned into a gas). It is when the chemicals are all liquids that it is placed into the column to be _____ into the different fractions. The gases cool as they rise up the tower. The different gases all have different boiling _____.

Having different boiling points means that as each one _____ down below its boiling point it turns back into a _____. These liquids collect at different _____ up the tower – allowing us to remove them and use them in that particular state.

For example the fraction that boils at 180°C is called _____. This is often used as fuel for _____. Residue is used for road ___ and the _____ of engines – it boils at 340ºC.

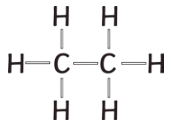
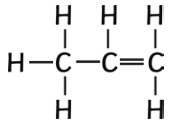
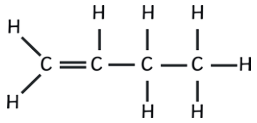
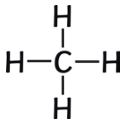
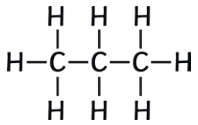
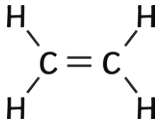
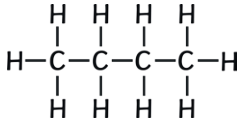
**Crude** **separated** **aeroplanes** **tar** **points** **fractional distillation** **cools** **kerosene** **liquid** **heights** **evaporated** **petrol** **lubrication** **boil** **chemicals** **distillation** **350ºC**

**Task:** Add as much detail as you can to the fractional distillation column used to separate crude oil into different fractions.



# Alkanes and Alkenes

Draw lines to match the name of the hydrocarbon with its displayed and written formulae.

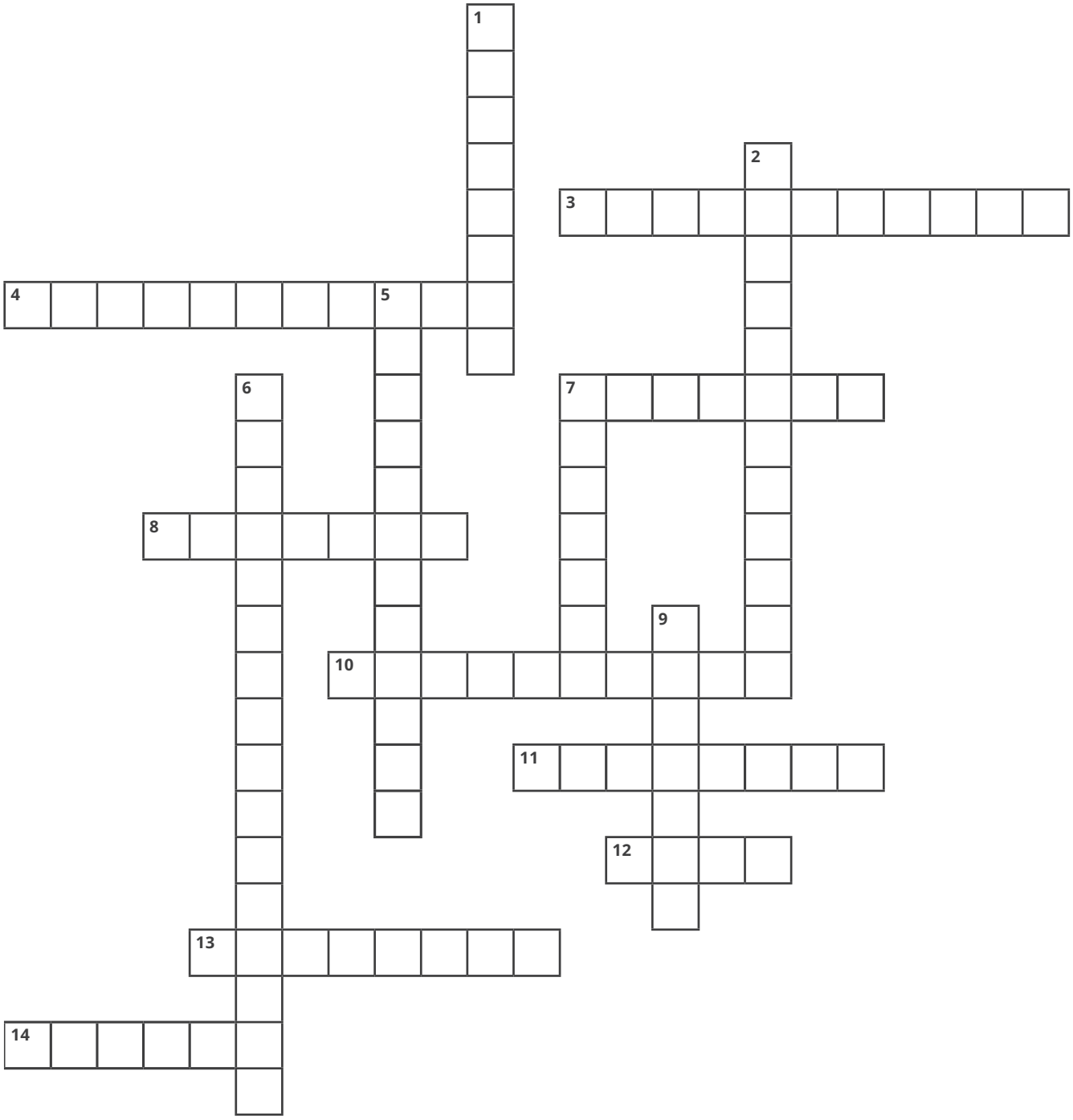
| | | |
|---|---|---|
| Methane |  | $C_4H_8$ |
| Ethane |  | $C_3H_6$ |
| Ethene |  | $C_4H_{10}$ |
| Propane |  | $C_2H_6$ |
| Propene |  | $C_2H_4$ |
| Butane |  | $C_3H_8$ |
| Butene |  | $CH_4$ |

Homework 1

# Organic Chemistry **Crossword**

Homework 2

Each of the answers to the clues relates to organic chemistry. Solve the clues to complete the crossword. Choose the answers from the box below. The numbers at the end of each clue tell you how many letters there are in the answer.




| | | |
|---|---|---|
| alkanes | cracking | fuel |
| alkenes | crude oil | homologous series |
| boiling point | evaporation | hydrocarbon |
| combustion | finite | propane |
| condensation | fraction | viscous |

Homework 2

## Across

3. A change of state from a liquid to a gas. (11)

4. A molecule made of hydrogen and carbon atoms only. (11)

7. A series of hydrocarbons that are more reactive than alkanes and can decolourise bromine water. (7)

8. An alkane molecule containing three carbon atoms. (7)

10. A reaction between a substance and oxygen in the air. The scientific word for burning. (10)

11. A group of hydrocarbons, with molecules containing a similar number of carbon atoms, that condense together when crude oil is separated by fractional distillation. (8)

12. A chemical substance, such as petrol, diesel or kerosene, that releases energy when burned. (4)

13. A fossil fuel formed from the remains of an ancient biomass consisting mainly of plankton that was buried in mud. (5,3)

14. A word to describe a limited resource that isn't replenished or replaced quickly enough to be considered renewable. (6)

## Down

1. A process used to convert long-chain hydrocarbons into shorter, more useful molecules. (8)

2. A change of state from gas to liquid. (12)

5. The temperature at which a substance changes from a liquid to a gas or from a gas to a liquid. This temperature increases as the size of a molecule increases. (7,5)

6. A series of compounds which have the same general formula and functional group, and react in a similar way. (10,6)

7. A series of hydrocarbons with the general formula $C_nH_{2n+2}$. (7)

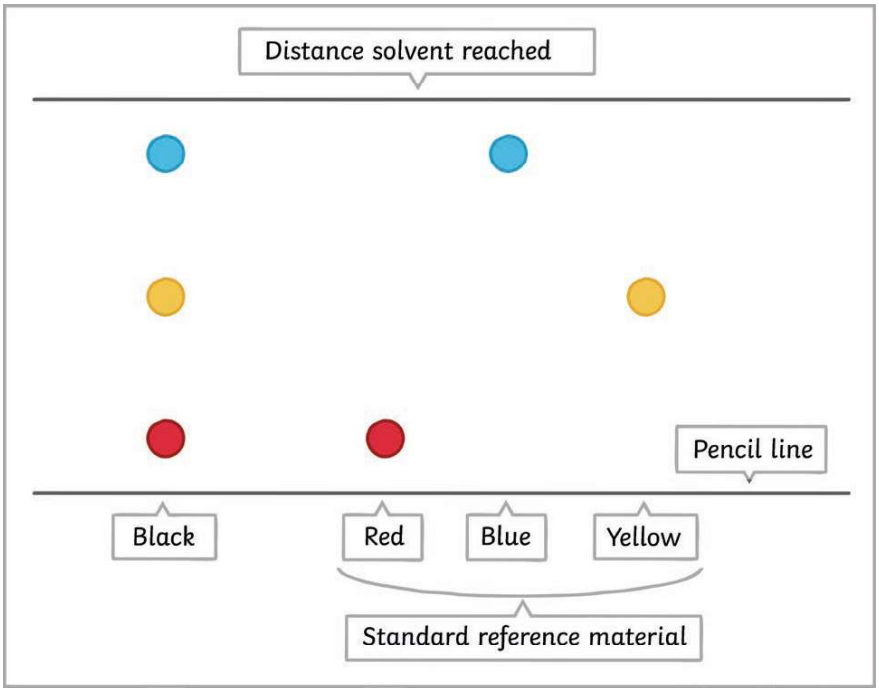
9. A word to describe a substance that does not flow easily, e.g. a long-chain hydrocarbon. (7)

Homework 3·

# Investigating the Separation of a Mixture of Dyes by Paper Chromatography **Exam Style Questions**

1. A student carried out a chromatography investigation to separate the different dyes in coloured inks.

The diagram below shows her results:




1(a) Calculate the $R_f$ value of yellow ink and complete the table of results below. **[2 marks]**

| **Ink** | **Distance travelled (mm)** | | **$R_f$ Value** |
|---|---|---|---|
| | Solvent | Compound | |
| Red | | | |
| Blue | | | |
| Yellow | | | |

1(b): What can you conclude about black ink from the information from the table and the chromatogram? **[2 marks]**

Homework 3·

1(c): Explain how paper chromatography can separate the substances.

You should include:

- an explanation of the technique;
- what can be concluded about the different inks. **[6 marks]**

Total for Question 1 **[10]**

2. The student asks another person in her class to look at her results and check her answers.

2(a). Why do scientists peer review other's work? **[2 marks]**

2(b). The other student notices that the measurement recorded for the distance travelled by the solvent is 5mm greater than the actual measurement for each sample.

What type of error has the student made? **[1 mark]**

Total for Question 2 **[3]**

Homework 4·

# Gas Tests - **Activity Sheet**

Draw a line to match the gas with the gas test result.

| | |
|---|---|
| **Carbon Dioxide** | Relights a glowing splint. |
| **Hydrogen** | A lighted splint makes a popping sound. |
| **Oxygen** | This gas turns limewater cloudy. |