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| --- | --- | --- | --- |
| **Topic** | Fractional distillation of crude oil | **Level** | GCSE |
| **Outcomes** | 1. To be able to understand and use the words viscous, volatile, fraction and boiling point. 2. To describe and explain how fractional distillation separates crude oil into different fractions. | | |

**Understanding the Language of Fractional Distillation**

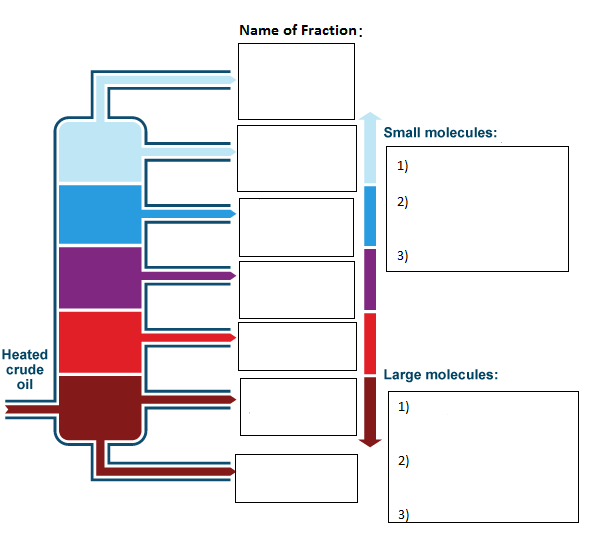
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| --- |
| How easy it is for a substance to change into a gas. |
| A group of hydrocarbons extracted from crude oil that have very similar boiling points. |
| Compounds made up of hydrogen and carbon atoms only. |
| How difficult it is for a liquid to flow. |
| The temperature at which a substance changes from a liquid into a gas (also the temperature at which a substance turns from gas to liquid!!). |
| A naturally occurring mixture of hydrocarbons. |

**In pairs, discuss the words below and match to their correct definition.**

|  |
| --- |
| **Boiling point** |
| **Fraction** |
| **Crude Oil** |
| **Viscosity** |
| **Hydrocarbon** |
| **Volatility** |

**Rearrange the following sentences to describe what happens during the fractional distillation of crude oil.**

1. **Crude oil** is heated until most of it evaporates and turns into gas.
2. The crude oil is then separated into different **fractions** at different heights in the column**.** Each fraction contains **hydrocarbons** with similar boiling points.
3. The evaporated crude oil enters the fractionating column.
4. The gases rise in the column.
5. When a substance reaches a height in the column where the temperature is equal to its **boiling point,** it condenses to form a liquid.



**Fill in the labels on the diagram above using the words below.**

Increasing viscosity - Decreasing viscosity – Petrol –

Refinery Gases - Fuel Oil - Decreasing volatility - Increasing volatility - Diesel – Bitumen - Lower boiling point - Higher boiling point -Bitumen – Kerosene

**Complete the following table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hydrocarbon chain length** | **Position extracted from column (Top or bottom?)** | **Boiling Point  °C**  **(High or Low?)** | **Viscosity**  **(High or Low?)** | **Volatility**  **(High or Low?)** |
| **Short (3-10)** |  |  |  |  |
| **Long (20-40)**  **C:\Users\sbadri.MCA\Pictures\oil21.bmp** |  |  |  |  |

**Now, using the words you have learnt, describe and explain how Bitumen is obtained from crude oil. Comment on its viscosity and volatility.**

When the crude oil enters the fractionating column……

**Progress:** further resources on organic chemistry are available here: <http://www.thescienceteacher.co.uk/organic/>