

SCIENCE (Chemistry)
ORGANIC CHEMISTRY (Petroleum and Fuel)

Name: _____ () Class: _____ Date: _____

Exercise 1

- 1) What are the 2 sources of fuel? _____
- 2) Crude oil/petroleum and natural gas are hydrocarbon? What is meant by a hydrocarbon?

- 3) What is the chemical name for the major component for natural gas? _____
- 4) Solid fuel, eg. coal, consist mainly of _____.
- 5) _____ is obtained from burning of fuel in air. The chemical reaction is called
_____.
- 6) Complete the following table for the three main fuels in the world.

Fuel	Physical state under room conditions
Natural gas	
	Liquid
	Soild

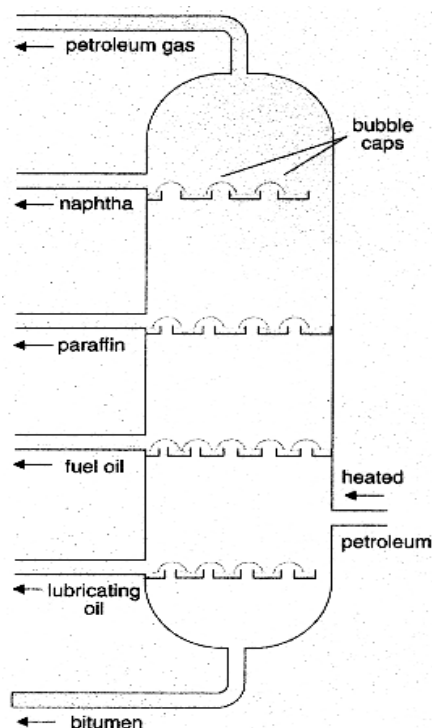
Exercise 2

- 1) Name the process used to separate the hydrocarbons from crude oil. _____
- 2) How do you know that a petroleum fraction is a mixture and not a single substance?

- 3) What is the property on which the process of fractional distillation depends?

- 4) Which of the fraction obtained crude oil
 - a) has the biggest molecules? _____
 - b) boils at the lowest temperature? _____

5) Name the 6 fractions obtained from crude oil and state their uses.



Fraction	Boiling point ($^{\circ}\text{C}$)	Size of molecules	Uses
_____ (e.g. methane, butane)	Below 40	Up to 4 carbon atoms	
	40-130	4-12 carbon atoms	
	150-200	10-16 carbon atoms	
	225-300	14-25 carbon atoms	
	300-400	20-70 carbon atoms	
	Above 400	Residue	

Optional Homework

Lubricating Oil Bitumen Kerosene Petrol Naphtha

Petroleum is a mixture of hydrocarbon molecules. The above hydrocarbons are some of the fractions which can be obtained from petroleum.

a) Name the method used to extract each fraction. _____

b) Arrange the hydrocarbons given according to the number of carbon atoms it contains.

Start with the hydrocarbon with the smallest number of carbon atoms.

c) Arrange the hydrocarbons given according to their boiling point. Start with the hydrocarbon with the lowest boiling point.

d) What relationship can you conclude between the size of the molecules and its boiling point?

e) Give 2 reasons why hydrocarbons which have large numbers of carbon atoms are not useful as fuel.