

# CRUDE OIL

Crude oil was formed from the remains of small marine animals and plants that were buried in the beds of the seas millions of years ago. The decay of these remains under the layers of overlaying rock formed the liquid known as crude oil or petroleum (from Greek + Latin words meaning 'rock oil'). Similar conditions led to the formation of the natural gas that is often found associated with crude oil as well as in deposits on its own.

Crude oil is a complex mixture of hydrocarbons. It has no uses in its raw form. To provide useful products, its components must be partly separated and, if necessary, modified. Once crude oil has been located and extracted, it must therefore be transported to a refinery where it is processed.

The different fractions are used as follows. The main use of refinery gas is as a gaseous fuel, but, like natural gas, it can be used as a starting point for making petrochemicals. Gasoline is a complex liquid mixture of hydrocarbons. The major use of gasoline is of course as a fuel in internal combustion engines. The part of the gasoline fraction used to produce chemicals is called naphtha.

Kerosene is used as a fuel in jet engines and for domestic heating purposes. It can also be cracked to produce extra gasoline.

Diesel oil or gas oil is used in diesel engines. The residual oil from the primary distillation is a highly complex mixture of involatile hydrocarbons. Most of it is used as fuel oil in large furnaces such as those in power stations or big ships. A proportion of it, however, is used to make lubricating oils and waxes.

To obtain lubricating oil and paraffin wax from the residue, the appropriate hydrocarbons must be distilled off. Paraffin wax is separated from lubricating oil by solvent extraction. The solid left after vacuum distillation is an involatile tarry material called bitumen or asphalt and is used to surface roads and to water-proof materials.

Hydrocarbons, which make up the more volatile fractions of crude oil, are the main and the most important components. Three different homologous series of hydrocarbons are present: alkanes, cycloalkanes and aromatics.

(from: Hill-Holman, *Chemistry in Context*, Nelson)

**1** Answer the following questions.

- a. What was crude oil formed from?
- b. Where does the word 'petroleum' derive from?
- c. How are lubricating oil and paraffin wax obtained from the residue?
- d. What are the main components of crude oil?

**2** What are these substances mentioned in Crude oil used for: refinery gas, gasoline, kerosene, diesel oil, residual crude?

**3** Find out to which of these words the couples of words and phrases listed below refer to: bed, decay, located, remains, tarry, wax. Then choose the correct meaning of each word, as used in Crude oil.

- a. dead bodies / ruins .....
- b. bottom of a water body / piece of furniture .....
- c. decomposition / loss of vigour .....
- d. discovered / situated .....
- e. substance produced by bees / substance obtained from oil .....
- f. delaying / tarlike .....