

Splitting crude oil into alkanes and alkenes

Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test covers fractional distillation, the formulae of alkanes and alkenes, combustion, cracking and the bromine water test. Answer all the questions without notes. Show your working in the calculation and write chemical equations with correct formulae.

Level: Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE C7

Time: 40 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Separating crude oil (3 marks)

Crude oil is separated in a fractionating column.

- State the property of hydrocarbons that makes separation possible. (1 mark)
- Bitumen leaves at the bottom of the column. Explain why. (2 marks)

Question 2 Formulae of hydrocarbons (2 marks)

- Give the formula of the alkane with 12 carbon atoms. (1 mark)
- Give the name and formula of the alkene with 3 carbon atoms. (1 mark)

Question 3 Combustion of butane (3 marks)

Butane, C_4H_{10} , is the fuel in a camping stove.

- Write a balanced equation for its complete combustion. (2 marks)
- Name the poisonous gas that may form if the oxygen supply is limited. (1 mark)

Question 4 Bromine water results (3 marks)

The figure shows what happens when bromine water is shaken with two liquids.



Bromine water shaken with liquid X and liquid Y.

- Which liquid is an alkene? (1 mark)
- Explain your answer using the structure of alkenes. (2 marks)

Question 5 Cracking (3 marks)

Cracking turns $C_{15}H_{32}$ into $C_{10}H_{22}$ and one other hydrocarbon.

- Give the formula of the other hydrocarbon. (1 mark)
- State one condition used in catalytic cracking. (1 mark)
- Explain why refineries crack long hydrocarbons. (1 mark)

Question 6 Methane combustion calculation (2 marks)

Methane, CH_4 , burns in a Bunsen burner. Calculate the mass of carbon dioxide produced when 8.0 g of methane burns completely. (A_r : C = 12, H = 1, O = 16.)

Question 7 Explain fraction properties (2 marks)

Petrol is used in motorbikes and fuel oil in ships. Explain why petrol is easier to ignite than fuel oil.

Question 8 Saturated or unsaturated (2 marks)

Explain the meaning of the words saturated and unsaturated and give one example hydrocarbon of each.