

Please write clearly in block capitals.

School _____

Class _____

Name _____

Teacher _____

GCSE CHEMISTRY

CHEMISTRY

Paper 2 (Topics C6-C10) · Higher tier · 2019 series · mapped to the AQA 8462 specification

Time allowed: 1 hour 45 minutes

Materials

For this paper you must have:

- a ruler
- a scientific calculator
- the periodic table (provided).

Instructions

- Answer all questions in the spaces provided.
- Use black ink or black ball-point pen.
- In all calculations, show clearly how you work out your answer.
- Do all rough work in this book.

Information

- The maximum mark for this paper is 100.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	

Answer all questions in the spaces provided.

1 This question is about rates and equilibrium.

1.1 State what must happen for two particles to react.

[1 mark]

1.2 Explain, in terms of activation energy, how a catalyst speeds up a reaction.

[2 marks]

1.3 A reaction produces 30 cm³ of gas in 6 s. Calculate the mean rate in cm³/s.

[2 marks]

1.4 Explain what is meant by a dynamic equilibrium, and use Le Chatelier's principle to predict the effect of adding more reactant.

[4 marks]

1.5 Use Le Chatelier's principle to predict the effect of increasing the temperature on an endothermic forward reaction.

[3 marks]

1.6 Explain how you would find the rate at a particular time using a tangent.

[3 marks]

2 This question is about organic chemistry.

2.1 Give the name and formula of the simplest alkene.

[1 mark]

2.2

Balance this equation: $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

[2 marks]

2.3

Describe how an addition polymer is formed.

[2 marks]

2.4

Describe a test to show a hydrocarbon is unsaturated, with the result.

[3 marks]

2.5

Explain why cracking is carried out, and name the type of reaction.

[3 marks]

2.6

Explain how the properties of hydrocarbons change as the chain gets longer.

[3 marks]

3

This question is about chemical analysis.

3.1

State one difference between a pure substance and a mixture.

[1 mark]

3.2

Explain how chromatography separates the substances in a mixture.

[2 marks]

3.3

A spot moves 2.1 cm and the solvent moves 7.0 cm. Calculate the R_f value and explain how it is used.

[3 marks]

3.4

Describe the tests, and positive results, for hydrogen, oxygen and chlorine.

[3 marks]

3.5

Describe the flame test colours for lithium, sodium and potassium ions.

[3 marks]

3.6

Describe the tests for carbonate ions and chloride ions, with results.

[3 marks]

4**This question is about the atmosphere.****4.1**

State the approximate percentage of nitrogen in the atmosphere.

[1 mark]

4.2

Explain how carbon became locked up in rocks and fossil fuels.

[2 marks]

4.3

Explain how photosynthesis changed the early atmosphere.

[2 marks]

4.4

Explain how greenhouse gases cause the greenhouse effect.

[3 marks]

4.5

Explain how the carbon footprint of a product could be reduced.

[3 marks]

4.6

Explain why future climate change is difficult to predict.

[3 marks]

5

This question is about atmospheric pollutants.

5.1

Name a pollutant that causes acid rain.

[1 mark]

5.2

Explain how oxides of nitrogen are formed in an engine.

[2 marks]

5.3

Explain the problems caused by sulfur dioxide.

[2 marks]

5.4

Explain the problems caused by carbon monoxide and particulates.

[3 marks]

5.5

Evaluate one method used to reduce carbon dioxide emissions.

[6 marks]

6 This question is about using resources.

6.1 Give the meaning of the term 'potable water'.

[2 marks]

6.2 Explain why distillation of sea water is expensive.

[2 marks]

6.3 Describe the main stages of treating waste water.

[3 marks]

6.4 Describe how copper can be extracted from low-grade ores by phytomining.

[3 marks]

6.5 Explain the advantages and disadvantages of recycling metals, using a life cycle assessment.

[4 marks]

7 This question is about chemical calculations.

7.1 A spot moves 4.2 cm and the solvent moves 6.0 cm. Calculate the R_f value.

[2 marks]

7.2 A reaction lost 8 g of mass in 20 s. Calculate the mean rate in g/s.

[3 marks]

7.3Calculate the concentration, in mol/dm³, of 0.1 mol in 200 cm³.**[3 marks]**

7.4For the reaction $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$, calculate the percentage atom economy for making CaO. ($\text{CaCO}_3 = 100$, $\text{CaO} = 56$, $\text{CO}_2 = 44$)**[3 marks]**

7.5Calculate the mass of carbon dioxide produced when 40 g of calcium carbonate decomposes. ($\text{CaCO}_3 = 100$, $\text{CO}_2 = 44$)**[3 marks]**

END OF QUESTIONS

Do not
write
outside the
box