**Chemical reactions**

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| Instructions to students  • You have 50 minutes to complete the test.  • Please answer all questions in the spaces provided.  • There is to be no talking during the test. | Marks  Section I: Multiple-choice questions: 10 marks  Section II: Short-answer questions: 34 marks  Section III: Extended-response questions: 6 marks  Total: 50 marks |

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| Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Score: /50  Grade: % |
| Comments: | |

Section I: Multiple-choice questions

For each question, circle the correct answer.

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| 1 The following reaction shows yellow, insoluble lead iodide forming when lead nitrate is added to potassium iodide. This is an example of a: | | L:\1. Publishing and Editorial\1. Product\Oxford Science\Oxford Science VICTORIA\Oxford Science 10 VIC\2. Extras\16. Class tests\Artwork\Final jpegs\CT0401_07059-rm.jpg |
| A | precipitation reaction. |
| B | decomposition reaction. |
| C | neutralisation reaction. |
| D | synthesis reaction. |
| 2 Compared to particles in a cold substance, particles in a hot substance have more: | | |
| A | light energy. | |
| B | kinetic energy. | |
| C | chemical potential energy. | |
| D | gravitational potential energy. | |
| 3 Catalysts are often used in industry because they: | | |
| A | allow reactions to go to completion. | |
| B | reduce the temperature at which a reaction occurs. | |
| C | make a reaction go faster. | |
| D | make it easier for reactants to react with one another. | |

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| 4 Why does increasing the surface area of a reactant increase the speed of some chemical reactions? | |
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| A | It increases the density of the reactant particles. |
| B | It increases the concentration of the reactant. |
| C | It alters the electrical conductivity of the reactant particles. |
| D | It exposes more reactant particles to a possible collision. |
| 5 The combustion of propane can be written by the following chemical equation:  C3H8 + 5O2 → 3CO2 + 4H2O  What are the products in this equation? | |
| A | C3H8 and 3CO2 |
| B | 3CO2 and 4H2O |
| C | C3H8 and 5O2 |
| D | 4H2O and 5O2 |
| 6 A substance that can supply or take the place of oxygen in a chemical reaction is known as: | |
| A | an oxide. |
| B | an oxate. |
| C | an oxidant. |
| D | a hydroxide. |

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| 7 2 Mg(s) + O2(g) → 2MgO(s)  The above equation is what type of reaction? | |
| A | Combustion |
| B | Decomposition |
| C | Respiration |
| D | Synthesis |
| 8 The greatest concentration of the ozone layer is at an altitude of: | |
| A | 10 km. |
| B | 50 km. |
| C | 20 km. |
| D | 30 km. |
| 9 Complete the equation: acid + metal hydroxide → salt + \_\_\_\_\_\_\_ | |
| A | hydrogen |
| B | oxygen |
| C | carbon dioxide |
| D | water |
| 10 A monomer is a: | |
| A | product of a monomatic reaction. |
| B | small molecule that makes up a polymer. |
| C | synthetic polymer. |
| D | compound that can be synthesised in a laboratory. |

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|  | Section I total marks:  /10 marks |

Section II: Short-answer questions

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| 11 What are the advantages of using nylon rather than canvas in tent manufacture? Are there any disadvantages? | |
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|  | /3 marks |
| 12 Give three examples of ways green chemistry has helped the environment. | |
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| 13 The following chemical reactions happen between CFCs and the atmosphere:  CCl2F2 + h → CClF2 + Cl  Cl + O3 → ClO + O2  ClO + O → Cl + O2  What happens to the chlorine atom emitted in the first equation? Why is this so bad? | |
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| 14 Methane gas (CH4) is used in gas heaters in homes all around Victoria during winter. When the heater is ignited, methane combines with the oxygen in the air to form carbon dioxide and water.  Write a word and chemical equation for the combustion of methane (CH4) in the space provided below. Make sure your chemical equation is balanced. | |
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| 15 In the future, your family might be driving a car fuelled by hydrogen. Give one advantage and one disadvantage of using hydrogen as a fuel source. | |
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|  | /2 marks |
| 16 Use the chemical equation below to answer the following questions:  2Al2O3  → 4Al + 3O2  a Identify one product in this reaction.  b Is this chemical equation balanced? Explain your answer.  c What type of reaction is this? | |
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| 17 What is the difference between thermal decomposition and electrolytic decomposition? | |
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|  | /2 marks |
| 18 What is a polymer? How is it formed? | |
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| 19 Describe three ways you could increase the rate of a reaction. | |
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| 20 Name the acid, the metal and the salt in the following reaction:  hydrochloric acid + magnesium → magnesium chloride + hydrogen | |
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|  | /3 marks |
| 21 What is quicklime used for? How is it produced? | |
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|  | /3 marks |
| 22 What is the law of conservation of mass? | |
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|  | /1 mark |
|  | Section II total marks:  /34 marks |

Section III: Extended-response questions

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| 23 Jane and Jacki were doing an experiment to investigate the effect of acid on magnesium at different solution temperatures and for different lengths of ribbon. They were provided with a Bunsen burner, a tripod, a measuring beaker, test tubes, a gauze mat, a bottle of hydrochloric acid, a roll of magnesium ribbon, some scissors and a thermometer. Their results are shown in the table below. |
| |  |  |  | | --- | --- | --- | | Temperature of solution (°C) | Length of magnesium ribbon (cm) | Time taken for the magnesium to react (s) | | 10 | 2 | 60 | | 10 | 4 | 80 | | 10 | 6 | 100 | | 20 | 2 | 30 | | 40 | 2 | 15 | |
| a Predict how many seconds a piece of magnesium ribbon of 3 cm length would take to react at 10°C. |
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| b Describe what Jane and Jacki would have seen when they placed the magnesium ribbon in the test tube containing acid. |
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| c Do these results show that the temperature of the solution has an effect on the rate at which the magnesium dissolves? Explain your thinking. |
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| d What could Jane and Jacki have done to make the reaction between the magnesium and the ribbon go even faster? |
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|  | /6 marks |
|  | **Section II total marks:**  /6 marks |