UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS GCE Ordinary Level

MARK SCHEME for the October/November 2009 question paper for the guidance of teachers

5126 SCIENCE (CHEMISTRY AND BIOLOGY)

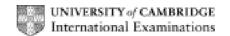
5126/03 Paper 3 (Theory (Chemistry)), maximum raw mark 65

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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| | | Section A | |
|---|-----|--|------|
| 1 | (a) | rusting – zinc | [1] |
| | (b) | acid rain – sulfur dioxide | [1] |
| | (c) | welding – acetylene (ethyne) | [1] |
| | (d) | glass cutting – diamond | [1] |
| | (e) | fermentation – yeast, | [1] |
| | | Accept all valid alternatives | |
| | | [Total: | : 5] |
| 2 | (a) | four (4 × 1) movement: gas/melt – fast movement/slow(er) movement (one) | |
| | | arrangement: gas/melt – far apart/close(er) together (one) | |
| | | attraction: gas/melt – none/strong or ionic or electrical (one) | [4] |
| | (b) | charged particles or charged atoms or ions present or ionic compound (1) so particles <u>free to move</u> (1) and so carry current | [2] |
| | (c) | little attraction between particles/molecules (1) particles/molecules easily separated by heat (1) | [2] |
| | | [Total: | 8] |

Mark Scheme: Teachers' version

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Syllabus

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Paper

03

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| | | | | GCE O LEVEL – October/November 2009 | 5126 | 03 |
| 3 | . , | sha eigl | nt ele | cture air of electrons (1), ctrons seemingly in outer shell of carbon (1), rons seemingly in each of four hydrogen shells (1) | | [3] |
| | (b) | (i) | E | | | |
| | (| (ii) | D | | | |
| | (i | ii) | С | | | |
| | (i | v) | В | | | |
| | (| v) | Α | (5 × 1) | | |
| | I | No | descr | ription of the origination of these electrons is necessary | y or should be pe | enalised. [5] |
| | | | | | | [Total: 8] |
| 4 | (a) | (i) | one | electron in outer shell (1) so Group I, | | |
| | (| ii) | sodi | um – eleven protons (1), twelve neutrons (1) | | |
| | (i | ii) | isoto | ppe – extra/fewer neutrons (1) | | [4] |
| | 1 | forn | ns po | perties of francium, e.g. reacts with water, sitive ions, any property of metals (3 × 1) alid alternatives including 'valency of one' and 'very re | active'. | [3] |
| | (c) | (i) | e.g. | Fr ₂ O (1) | | |
| | (| (ii) | e.g. | FrC1(1) | | [2] |
| | | | | | | [Total: 9] |
| 5 | hydrochloric acid – $HCl(1) - H^{+}$ or $H_{3}O^{+}(1)$ pH 0 – 3 (1) potassium hydroxide – KOH (1) – OH ⁻ (1) pH 10 – 14 (1) salt – potassium chloride (1) | | | | [7] | |
| | | • | | 、 | | |
| 6 | | | | o 1/12 th (1) a carbon–12 atom (1) ther standards | | |
| | | | | nydrogen –1, 1/16 th oxygen–16 | | [2] |
| | (b) | rel. | mol. | mass of potassium hydroxide 39 + 16 + 1 = 56 | | [1] |
| | (c) | ½ × | 36.5 | × 2 = 18.25 | | [1] |

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[Total: 4]

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| 7 | (a) | epsilon | | | [1] |
| | (b) | alpha | | | [1] |
| | (c) | delta | | | [1] |
| | (d) | epsilon | | | [1] |
| | | | | | [Total: 4] |
| | | | Section B | | |
| 8 | (a) | or heatin | dioxide urning carbon air/oxygen (1) with equation (1) ug limestone (one) with equation (one) oxidising carbon' | | |
| | | carbon d | monoxide ioxide combines with carbon (1) with equation (1) carbon burns in a limited supply of air gives carbon mo | noxide' | |
| | | iron iron(III) o with equa | exide is <u>reduced by carbon monoxide</u> (1) to form iron ation (1) | | [6] |
| | (b) | G is iron | um sulfate; (II) hydroxide; (III) hydroxide; I) sulfate | | |
| | | | valency state for iron should be penalised once only | | [4] |
| | | | | | [Total: 10] |
| 9 | (a) | | size – either/or bigger/smaller particles, slower/faster ture of acid – either/or higher/lower temperature, fast | | n (1) [2] |
| | (b) | use of gr counting gradient or if answ – a max | op magnesium into acid – collect gas (1), measure volume produced against time (1) (1) bubbles (1) over time (1) acceptable for first three at any one time gives the speed/rate of reaction (1) or wered question incorrectly by comparing other variable of four marks – compare something (e.g. conc., form g. bubbles stop, material disappears) (one), | marks compare mean | rates |
| | (c) | | above experiment e experiment exactly (1) but at a different temperature o | f acid (1) compar | e times (1) [3] |
| | | | | | [Total: 10] |

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10 (a) petroleum separation – vapours heated (1) passed into the base of fractionating tower (1) vapours rise/condense at different levels (1)

any two products from petroleum syllabus gives: petrol, naphtha, paraffin, diesel, lubricating oils, bitumen. accept alternative names (2 × 1) accept also gasoline for petrol, kerosene for paraffin, and petroleum gas

any two uses (2×1) [7]

(b) structure ethene showing double bond (1), double bond opens/breaks (1), many, '(n)', molecules can join together (polymerise) (1).

[Total: 10]

[3]