Rewarding Learning

General Certificate of Secondary Education
2013–2014

Double Award Science: Chemistry

Unit C1

Foundation Tier

[GSD21]

THURSDAY 14 NOVEMBER 2013, MORNING

MARK SCHEME

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

	AVAILABLE MARKS

1 **(a)** Sodium is stored under oil. [1]

(b) The freshly cut surface is shiny. [1]

(c) Idea that it tarnishes [1] quickly [1] [2]

(d) **(i)** Idea that sodium is very reactive **not** idea of danger unqualified [1]

(ii) Idea that sodium will react with the moisture on your hands or idea of qualified harm/danger e.g. burning . . . or tongs prevents above [1] — 6

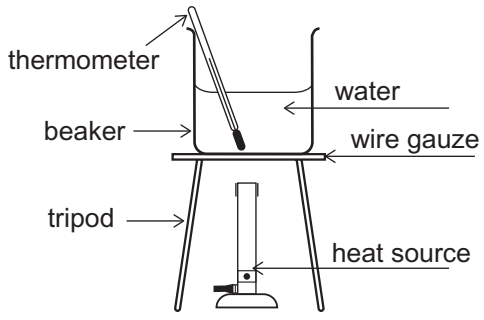
2

Chemical Term	
solvent	[1]
insoluble	[1]
immiscible	[1]
residue	[1]
distillate	[1]

5

3 **(a)** Beaker with water + thermometer [1]
Tripod with gauze [1]
Heat source [1]
4 or more labels [2]

(Award [1] for 2 or 3 labels
If heat source is arrowed with 'heat' this does not count as a label) [5]



(b) measuring cylinder [1]

(c) idea that oxygen leaves the water [1] — 7

AVAILABLE MARKS

4 **(a)** NaCl [1]

(b) white [1] crystals/solid [1] *not* powder [2]

(c) idea that it contains two elements [1] which are (chemically) combined [1] [2]

(d) **Indicative content**

- place in a suitable container
- add water
- stir (with a stirring rod)
- filter (the sand from the water)
- using filter paper and a filter funnel
- evaporate (the filtrate)
- using an evaporating dish and a Bunsen burner

Response	Mark
Candidates must use appropriate specialist terms throughout to describe how a dry sample of sodium chloride can be obtained from the mixture in a logical sequence, using 6 or 7 of the indicative points. They use good spelling, punctuation and grammar and the form and style are of a high standard.	5–6
Candidates use 4 or 5 of the indicative points to describe how a sample of sodium chloride can be separated from the mixture in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	3–4
Candidates make reference to 1–3 of the indicative points using limited spelling, punctuation and grammar. The form and style is of limited standard and they have made no use of specialist terms.	1–2
Candidates make no reference to the main points above and offer no other suitable response.	0

[6]

11

		AVAILABLE MARKS
5	**(a)** idea that 9 carat gold is a *mixture* [1] of (at least two) metals [1] [2]	
	(b) idea that pure gold is the most expensive option [1] idea that pure gold is a very soft material (and would not be hardwearing enough for jewellery) [1] [2]	
	(c) **(i)** two correct symbols [1], four correct [2] copper Cu silver Ag nickel Ni gold Au [2]	
	(ii) transition metals allow d block [1]	7
6	**(a)** $2Al_2O_3 \rightarrow 4Al + 3O_2$ [1] [1] [2]	
	(b) cathode [1]	
	(c) electrolysis is the **decomposition** [1] of **a liquid** [1] compound using **electricity** [1] [3]	6
7	**(a)** potassium chloride [1]	
	(b) potassium carbonate apply cm [1]	
	(c) idea that solid disappears/dissolves [1] bubbles/fizzing [1] heat given off [1] *colourless* solution formed [1] any two [2]	
	(d)	

Name of element	Number of atoms of the element in the formula
potassium	2
carbon	1
oxygen	3

[3] 7

6 correct = [3]; 4 or 5 correct = [2]; 2 or 3 correct = [1]
Number of atoms depends on correct element

AVAILABLE MARKS

8 **(a)**

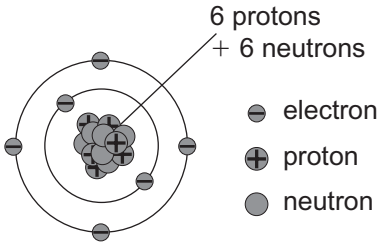
Particle	Relative charge	Relative mass
electron	–1	(almost) 0*
proton	+1	1
neutron	0	1

[3]

*allow $\frac{1}{1800} - \frac{1}{2000}$

6 correct = [3], 4 or 5 correct = [2], 2 or 3 correct = [1]

(b) electrons in shells 2,4 [1]
6 protons and 6 neutrons [1]
in the nucleus [1]
2 or 3 labels [1]



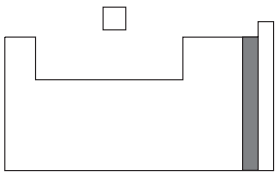
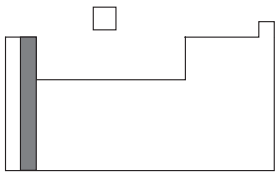
Carbon atom

[4]

(c) idea that each atom has 6 electrons and 6 protons/same number of protons and electrons [1]
carbon–14 has more neutrons or carbon–12 has fewer neutrons [1]
carbon–14 has 2 (more neutrons) or carbon–12 has 2 (fewer neutrons) [1]

[3]

10

		AVAILABLE MARKS
9	**(a)** an element is a substance which has only one type of atom/ cannot be broken down into anything simpler (by chemical means) [1]	
	(b) **(i)** (John) Newlands [1]	
	(ii) When elements are arranged in order of (relative) **atomic mass** [1] (**NOT** *mass number)*/every 8th element has **similar properties** [1]. [2]	
	(c) atomic number [1]	
	(d) **(i)** periods [1]	
	(ii) groups (apply cm) [1]	
	(e) any 2 suitable general physical properties of a metal e.g. conduct heat, conduct electricity, ductile, malleable, sonorous, high melting point, shiny *NOT* hard, NOT dense, *NOT* solid, *NOT* high B.P. [2]	
	(f) **(i)**  halogens [1] **(ii)**  alkaline earth metals [1] [2]	11
	Total	**70**