Rewarding Learning

General Certificate of Secondary Education
2014–2015

Double Award Science: Chemistry

Unit C1

Foundation Tier

[GSD21]

THURSDAY 13 NOVEMBER 2014, 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)**	Any **2** from: aluminium/copper/magnesium 2 × [1]	[2]	
	(b)	**(i)** graphite	[1]	
		(ii) magnesium	[1]	
		(iii) copper	[1]	
		(iv) diamond	[1]	
	(c)	Al	[1]	
	(d)	an alloy is a **mixture** [1] of elements at least one of which is a **metal** [1]	[2]	9
2	**(a)**	solid [1] gas [1] liquid [1]	[3]	
	(b)	dark grey (solid) **or** grey-black **or** black [1] purple vapour [1] which reform crystals on the watch glass [1]	[3]	
	(c)	halogens	[1]	7
3	**(a)**	an element contains (only) one type of atom **or** an element cannot be broken into anything **simpler** (by chemical means)	[1]	
	(b)	can be compressed [1] takes the volume of the container it is in [1]	[2]	
	(c)		[1]	
	(d)	**(i)** H_2	[1]	
		(ii) correct sharing [1] correct no of electrons (dependent on first mark) [1] dot and cross notation [1]	[3]	8

					AVAILABLE MARKS
4	**(a)**	**(i)**	diagram of recognisable assembled apparatus filter paper, filter funnel, test-tube – test tube is essential as mentioned in the question = 1 mark 3 apparatus labels = 2 2 or 1 apparatus label = 1 apply cm to container label if apparatus mark lost, e.g. if conical flask drawn and labelled	[3]	
		(ii)	filtrate labelled correctly as liquid in test-tube	[1]	
	(b)	**(i)**	universal indicator	[1]	
		(ii)	**blue** litmus	[1]	
		(iii)	(add universal indicator) observe colour [1] compare to a (standard colour) chart [1]	[2]	
	(c)		candidates must recognise • an acid pH • pH meter gives accurate readings to 2 decimal places pH 5 = [1] pH 5.34 = [2]	[2]	10
5	**(a)**		in order of increasing atomic mass	[1]	
	(b)		chemical	[1]	
	(c)		he left gaps for undiscovered elements [1] there were no noble gases [1]	[2]	4
6	**(a)**		magnesium fluoride	[1]	
	(b)		correct direction of transfer of electrons [1] one magnesium atom loses 2 electrons [1] two fluorine atoms each gain 1 electron. [1]	[3]	
	(c)		ions	[1]	5

7 Indicative content

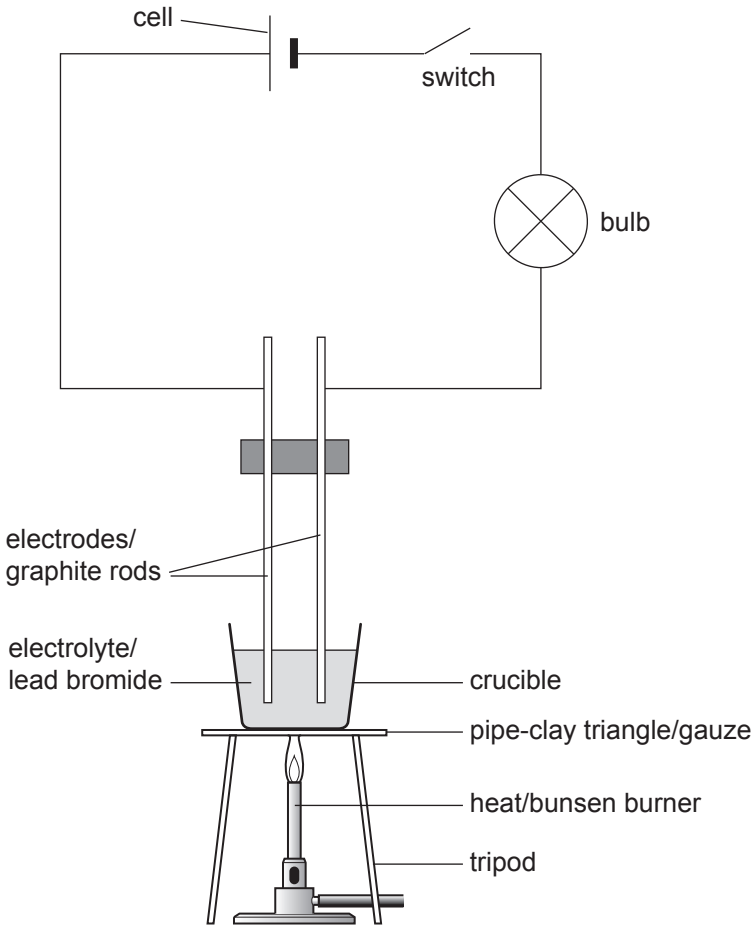
- Anhydrous
- Copper(II) sulfate (OR Cobalt(II) chloride (paper))
- White (OR blue)
- Blue (in water) (OR pink (in water))
- Test boiling point/freezing point
- If BP = 100 °C/freezing point = 0 °C (liquid is water)

Band	Response	Mark
A	Candidates make reference to 5–6 of the main points above to describe good tests to find out which liquid is water. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates make reference to 3–4 of the main points above to describe test(s) to find out which liquid is water. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates make reference to 1–2 of the main points above using limited spelling, punctuation and grammar. The form and style are of limited standard and they have made no use of specialist terms.	[1]–[2]
D	Candidates make no reference to the main points and offer no other suitable response.	[0]

AVAILABLE MARKS

6

8 (a)



recognisable electrical circuit (bulb and switch not required but rods essential) [1]
crucible with substance [1] rods dipping into lead bromide (thus connecting substance to circuit) [1]
method of heating below crucible [1]
3 labels [1]
5 or more labels [2] (graphite rods/electrodes/1 label, label anode and cathode/2 labels)
ANY [5] out of [6] [5]

(b) ions [1]
free to move [1]
charge [1] [3]

(c) $PbBr_2$ at the anode brom**ine** [1]
at the cathode lead [1]
LiCl at the cathode chlor**ine** [1] [3]

AVAILABLE MARKS

11

				AVAILABLE MARKS
9	**(a)**	solubility changes with temperature	[1]	
	(b)	step 2 (add) a known volume [1] of water [1] Max 20 cm^3 step 4 (wait until) crystals form [1] step 6 (add) another known volume [1] of water [1] accept or another known mass [1] of solid [1] no credit if both water and solid added	[5]	
	(c) **(i)**	40	[1]	
	(ii)	Saturated [1] 100 g of water is saturated when 27 g of solid is added [1]; idea that 50 g is saturated when 13.5 g of solid is added **or** idea that there would be 36 g of $CUSO_4$ added to 100 g of water [1]	[3]	10
			Total	**70**