Rewarding Learning

General Certificate of Secondary Education
2015–2016

Double Award Science: Chemistry

Unit C1

Foundation Tier

[GSD21]

THURSDAY 12 NOVEMBER 2015, 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.

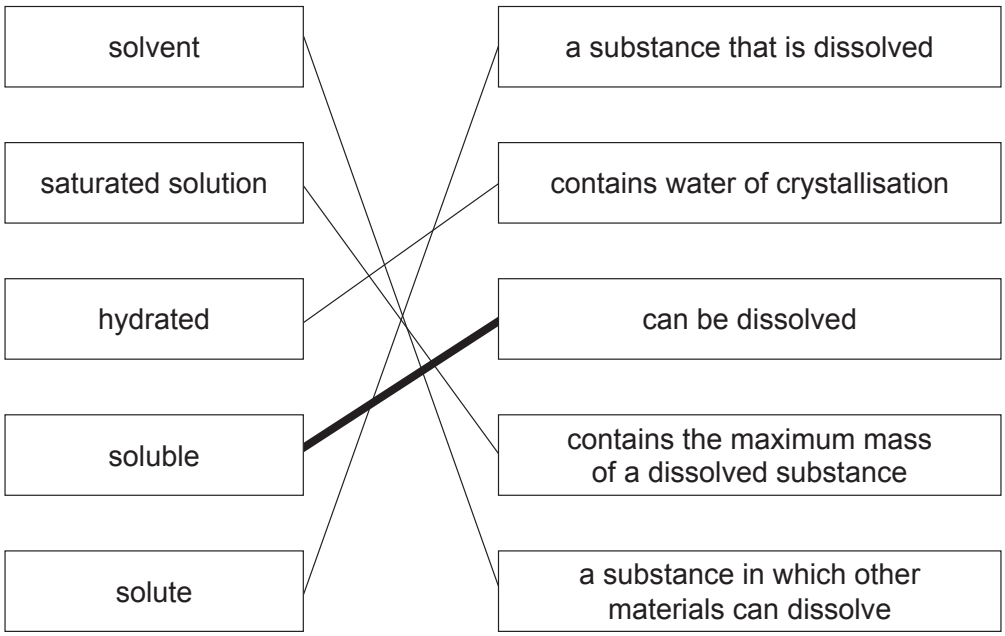
The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends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



1 correct = [1]; 2 or 3 correct = [2]; 4 correct = [3] [3]

(b) skull and crossbones symbol [1] 4

2 (a)

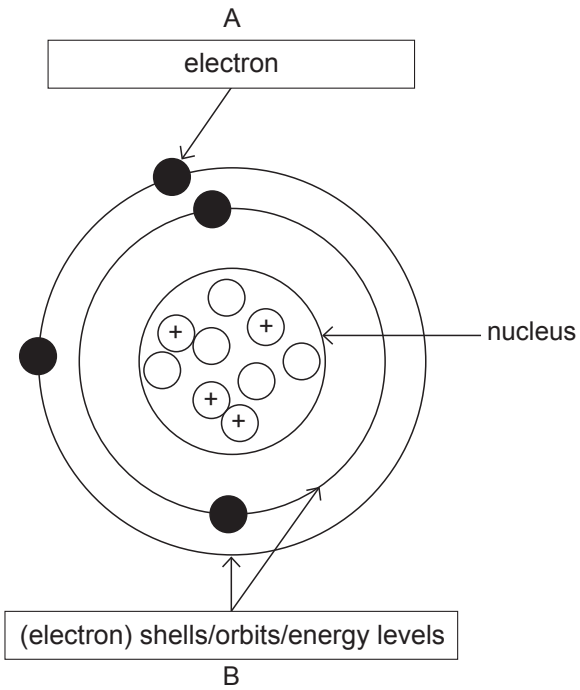
Property	Solid	Liquid	Gas
Can be compressed			
Takes the volume and shape of the container			✓ [1]
Takes only the shape of the container		✓ [1]	
Will condense when cooled			✓ [1]
Has a fixed shape	✓ [1]		

[1] mark per tick [4]

(b) (i) C [1]

(ii) A [1]

(c) X – evaporation [1]
Y – sublimation [1]
Z – freezing [1] [3] 9

					AVAILABLE MARKS
3	**(a)**	compound		[1]	
	(b)	**(i)**	alloy	[1]	
		(ii)	Any **two** from: ductile/malleable/sonorous/shiny/high melting point/strong 2 × [1]	[2]	
	(c)	**(i)**	hydrogen	[1]	
		(ii)	contains only one type of atom/cannot be broken down into anything simpler (by chemical means)	[1]	
	(d)		idea that it can (easily) be separated (into its individual components)	[1]	
	(e)	**(i)**	X – wire gauze/pipe clay triangle [1] NOT heat mat Y – measuring cylinder [1]	[2]	
		(ii)	temperature (not heat)	[1]	
		(iii)	in measuring cylinder/dripping from the (Liebig) condenser/ clearly labelled in the (Liebig) condenser	[1]	
					11
4	**(a)**			[2]	
	(b)	**(i)**	proton	[1]	
		(ii)	atomic number = 4	[1]	
	(c)		alkaline earth metals	[1]	5

5 Indicative content

AVAILABLE MARKS

safely carrying out the reaction
- wearing goggles
- using tongs or tweezers
- removing oil from sodium (with paper)
- using a small piece/cutting a small piece
- use a safety screen
- gloves (safety)

Maximum 3 indicative points

observations
- floats
- melts/forms a ball
- forms an alkaline solution/colourless solution
- can catch fire/orange-yellow flame
- gives off a gas/fizzing/bubbles
- dissolves/disappears/gets smaller
- heat produced
- idea of a fast/vigorous reaction
- moves on surface

Maximum 4 indicative points

Response	Mark
Candidates make reference to **6 or 7** of the indicative points above to describe the safety precautions and observations made during the experiment. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
Candidates make reference to **4–5** of the indicative points above to describe the safety precautions and observations made during the experiment. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
Candidates make reference to **2–3** of the main points above using limited spelling, punctuation and grammar. The form and style are of a limited standard and they have made no use of specialist terms.	[1]–[2]
Candidates make **fewer than 2** references to the main points and offer no other suitable response.	[0]

[6] 6

6 (a) soluble (in water)/idea that they dissolve [1]
idea of being formed from a metal and a non-metal [1] [2]

(b) candidates draw the electronic configuration of a calcium ion 2,8,8 [1]
charge +2 (This should be placed in the box provided but mark it correct wherever it is placed.) [1] [2]

(c) 6 [1]

(d) $MgSO_4$ [1]
K_2CO_3 [1] [2]

7

					AVAILABLE MARKS
7	**(a)**	The Law of Octaves		[1]	
	(b)	**(i)**	in order of (increasing) atomic mass	[1]	
		(ii)	Noble gases/group 8/group 0	[1]	
		(iii)	idea that these elements have (very) similar **chemistry**/have (very) similar **chemical reactions**	[1]	
	(c)	chlorine		[1]	5
8	**(a)**	0–2 (NOT 1–2)		[1]	
	(b)	**(i)**	copper sulfate [1] water [1] any order	[2]	
		(ii)	it (is a reaction between an acid and a base which) forms a salt and water [1] only (clearly implied) [1] idea of hydrogen ions forming water gets [1]	[2]	
		(iii)	colourless [1] to blue [1]	[2]	
	(c)	**(i)**	$Na_2O + 2HCl \rightarrow 2NaCl + H_2O$ NaCl [1] H_2O [1] if a third product is given maximum mark is [1] balancing [1]	[3]	
		(ii)	it is a base [1] it is soluble [1]	[2]	12
9	**(a)**	electrodes allow anode and cathode – both required		[1]	
	(b)	graphite: is a (good) conductor of **electricity**/is inert/high melting point **or** idea that graphite is inert **or** high melting point		[1]	
	(c)	ion		[1]	
	(d)	lithium		[1]	4

			AVAILABLE MARKS
10	**(a)**	sharing (a pair of) electrons unless wrongly qualified e.g. not elements sharing electrons [1]	
	(b)	correct sharing between one hydrogen atom and one chlorine atom [1] correct number of outer electrons for each atom [1] this mark is awarded only when 1st mark is given correct dot and cross representation [1] [3]	
	(c)	atoms [1] break* molecules [1] break* * [1] if break given twice [3]	7
		Total	**70**