



# JABchem



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# Past Papers Int 1 Chemistry

# 2014 Marking Scheme

Grade Awarded	Mark Required		% candidates achieving grade
	(/60)	%	
A	42+	70%	44.4%
B	36+	60%	25.8%
C	30+	50%	15.3%
D	27+	45%	6.2%
No award	<27	<45%	8.4%

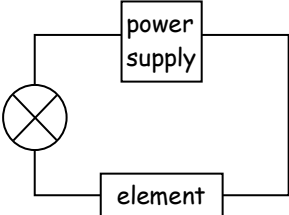
Section:	Multiple Choice	Extended Answer
Average Mark:	13.4 /20	26.0 /40


# 2014 Int 1 Chemistry Marking Scheme

MC Qu	Answer	% Pupils Correct	Reasoning								
1	D	80	<input type="checkbox"/> A A gas given off does not happen in every chemical reaction <input type="checkbox"/> B A solid being formed does not happen in every chemical reaction <input type="checkbox"/> C A colour change does not happen in every chemical reaction <input checked="" type="checkbox"/> D A new substance is always formed in every chemical reaction								
2	A	65	<input checked="" type="checkbox"/> A Oxygen gas relights a glowing splint <input type="checkbox"/> B Hydrogen gas burns with a pop <input type="checkbox"/> C Nitrogen gas does not relight a glowing splint <input type="checkbox"/> D Carbon dioxide gas turns lime water milky								
3	D	53	<input type="checkbox"/> A ①+②: both particle size and temperature are changing ∴ no conclusion made <input type="checkbox"/> B ②+③: both concentration and temperature are changing ∴ no conclusion made <input type="checkbox"/> C ③+④: only particle size is changing ∴ conclusion on effect of particle size <input checked="" type="checkbox"/> D ①+④: only concentration is changing ∴ conclusion on effect of concentration								
4	C	29	<input type="checkbox"/> A Lower temperature would still give the same volume of gas (but more slowly) <input type="checkbox"/> B More concentrated acid would give a steeper graph at the beginning <input checked="" type="checkbox"/> C Using half a tablet gives off half the volume of gas <input type="checkbox"/> D Crushed tablets would give a steeper graph at the beginning								
5	D	87	<input type="checkbox"/> A Diagram shows molecule of alcohol with formula: $CH_4O$ <input type="checkbox"/> B Diagram shows molecule of alcohol with formula: $C_2H_6$ <input type="checkbox"/> C Diagram shows molecule of alcohol with formula: $C_2H_6O_2$ <input checked="" type="checkbox"/> D Diagram shows molecule of alcohol with formula: $C_2H_5OH$ ( $C_2H_6O$ )								
6	B	83	<input type="checkbox"/> A Phosphorus <i>Dichloride</i> has a formula of $PCl_2$ <input checked="" type="checkbox"/> B Phosphorus <i>Trichloride</i> has a formula of $PCl_3$ <input type="checkbox"/> C Phosphorus <i>Tetrachloride</i> has a formula of $PCl_4$ <input type="checkbox"/> D Phosphorus <i>Monochloride</i> has a formula of $PCl$								
7	A	91	<p>pH    0    1    2    3    4    5    6    7    8    9    10    11    12    13    14</p> <p>Description    ←    increasing acidity    Neutral    increasing alkalinity    →</p>								
8	B	43	<input type="checkbox"/> A Lemonade is an acid because it has carbon dioxide dissolved in it <input checked="" type="checkbox"/> B Oven cleaner is an alkaline cleaning material <input type="checkbox"/> C Soda water is an acid because it has carbon dioxide dissolved in it <input type="checkbox"/> D Vinegar is a solution of an acid called ethanoic acid								
9	C	82	<input type="checkbox"/> A nitric acid + calcium carbonate    →    calcium nitrate + water + carbon dioxide <input type="checkbox"/> B hydrochloric acid + calcium carbonate    →    calcium chloride + water + carbon dioxide <input checked="" type="checkbox"/> C sulphuric acid + calcium carbonate    →    calcium sulphate + water + carbon dioxide <input type="checkbox"/> D phosphoric acid + calcium carbonate    →    calcium phosphate + water + carbon dioxide								
10	D	77	<input type="checkbox"/> A copper and tin would produce a voltage in an electrochemical cell <input type="checkbox"/> B iron and tin would produce a voltage in an electrochemical cell <input type="checkbox"/> C magnesium and tin would produce a voltage in an electrochemical cell <input checked="" type="checkbox"/> D The same metal attached in a cell does not produce a voltage in a cell								
11	C	87	<table border="1" style="margin: auto;"> <tr> <td style="width: 50%;">Natural Fibres</td> <td style="width: 50%;">Synthetic Fibres</td> </tr> <tr> <td>nylon</td> <td>cotton</td> </tr> <tr> <td>silk</td> <td>polyester</td> </tr> <tr> <td>wool</td> <td>terylene</td> </tr> </table>	Natural Fibres	Synthetic Fibres	nylon	cotton	silk	polyester	wool	terylene
Natural Fibres	Synthetic Fibres										
nylon	cotton										
silk	polyester										
wool	terylene										
12	D	71	<input type="checkbox"/> A Oil is a fossil fuel ∴ oil is a non-renewable energy source <input type="checkbox"/> B Coal is a fossil fuel ∴ coal is a non-renewable energy source <input type="checkbox"/> C Peat is a fossil fuel ∴ peat is a non-renewable energy source <input checked="" type="checkbox"/> D Biogas is made from decomposing food ∴ biogas is a renewable energy source								



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Long Qu	Answer	Reasoning																												
1a	Sb	Each element has its own symbol and atomic number. Each element symbol starts with a capital letter and if there is a second letter in the symbol then it is lower case.																												
1b(i)	Reshapes on heating	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">thermoplastic</td> <td style="padding: 2px;">Plastic which reshapes on heating</td> </tr> <tr> <td style="padding: 2px;">thermosetting</td> <td style="padding: 2px;">Plastic which does not reshape on heating</td> </tr> </table>	thermoplastic	Plastic which reshapes on heating	thermosetting	Plastic which does not reshape on heating																								
thermoplastic	Plastic which reshapes on heating																													
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1b(ii)	Fibres	Largest pie section is fibres.																												
2a	Line graph showing:	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;"><math>\frac{1}{2}</math> mark</td> <td style="padding: 2px;"><math>\frac{1}{2}</math> mark</td> <td style="padding: 2px;"><math>\frac{1}{2}</math> mark</td> <td style="padding: 2px;"><math>\frac{1}{2}</math> mark</td> </tr> <tr> <td style="padding: 2px;">Water temperature label and scale</td> <td style="padding: 2px;"><math>^{\circ}\text{C}</math> units on x-axis</td> <td style="padding: 2px;">Points plotted correctly</td> <td style="padding: 2px;">Joining the points</td> </tr> </table>	$\frac{1}{2}$ mark	$\frac{1}{2}$ mark	$\frac{1}{2}$ mark	$\frac{1}{2}$ mark	Water temperature label and scale	$^{\circ}\text{C}$ units on x-axis	Points plotted correctly	Joining the points																				
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Water temperature label and scale	$^{\circ}\text{C}$ units on x-axis	Points plotted correctly	Joining the points																											
2b	325	Answers ranging from 320 to 330 are acceptable																												
2c	Polymers Amino acids	Proteins are <b><u>POLYMERS</u></b> and are made from <b><u>AMINO ACIDS</u></b>																												
3a	Car engines or Thunder/lightning	Petrol engine cars have sparks from the spark plugs to ignite the petrol/air mixtures. This spark provides the energy to join together nitrogen and oxygen. Lightning also can provide this energy.																												
3b	sulphur dioxide or carbon dioxide	Nitrogen dioxide, sulphur dioxide and carbon dioxide all dissolve in water to form an acidic solution.																												
3c	Any pH below 7	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td> </tr> <tr> <td colspan="5" style="text-align: left;">← increasing acidity</td> <td colspan="2" style="text-align: center;">Neutral</td> <td colspan="6" style="text-align: right;">increasing alkality →</td> </tr> </table>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	← increasing acidity					Neutral		increasing alkality →					
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14																
← increasing acidity					Neutral		increasing alkality →																							
3d	carbon dioxide	acid + metal carbonate $\longrightarrow$ salt + water + carbon dioxide																												
4a	110	Each element has its own symbol and atomic number																												
4b	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px; height: 20px;"></td><td style="padding: 2px;">YES</td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="padding: 2px;">YES</td></tr> </table>		YES		YES	Elements in the same vertical column in the Periodic Table have similar chemical properties. The elements above Darmstadtium are all electrical conductors and conductors of heat.																								
	YES																													
	YES																													
4c		If the bulb lights up then the element being tested is an electrical conductor																												
5a	rusting	All metals corrode but only the corrosion of iron is called rusting.																												
5b	Salt is present	Sea water contains ions of salt which speed up the rate of corrosion/rusting.																												
5c	Zinc is more reactive than iron	Zinc provides sacrificial protection to iron because it is more reactive than iron. Zinc protects iron by giving it electrons.																												
6a	quartz magnetite cassiterite	The lower the density the nearer the top of the liquid the substance will be.																												
6b	tin oxide + carbon $\downarrow$ tin + carbon dioxide	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">tin oxide</td> <td style="padding: 0 10px;">+</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">carbon</td> <td style="padding: 0 10px;"><math>\longrightarrow</math></td> <td style="border: 1px solid black; padding: 5px; text-align: center;">tin</td> <td style="padding: 0 10px;">+</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">carbon dioxide</td> </tr> </table>	tin oxide	+	carbon	$\longrightarrow$	tin	+	carbon dioxide																					
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6c	Tin does not corrode quickly	As tin is very slow to corrode it can be used to coat steel cans. The steel can does not corrode underneath as the tin layer prevents air and water getting to the steel underneath.															
7a	Any answer from:	<table border="1"> <tr> <td>kills wildlife</td> <td>bad for environment</td> <td>damages our health</td> <td>kills fish</td> </tr> <tr> <td>harmful</td> <td>causes pollution</td> <td>damages environment</td> <td>kills birds</td> </tr> </table>	kills wildlife	bad for environment	damages our health	kills fish	harmful	causes pollution	damages environment	kills birds							
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7b	Detergent dissolves in both oil & water	 <p><u>HEAD</u> soluble in water</p> <p><u>TAIL</u> Soluble in oil/grease</p>															
8a	Any answer from:	<table border="1"> <tr> <td>Non-biodegradable</td> <td>Saves crude oil</td> <td>Saves resources</td> <td>Reused and causes less harm</td> </tr> <tr> <td>Long time to break down</td> <td>(Oil) is finite</td> <td>Finite resource</td> <td></td> </tr> <tr> <td>Reduce land fills</td> <td>(Oil) will run out</td> <td>Litter</td> <td>Damages wildlife</td> </tr> </table>	Non-biodegradable	Saves crude oil	Saves resources	Reused and causes less harm	Long time to break down	(Oil) is finite	Finite resource		Reduce land fills	(Oil) will run out	Litter	Damages wildlife			
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8b	ethene	<table border="1"> <tr> <td>Monomer</td> <td>ethene</td> <td>propene</td> <td>chloroethene</td> <td>styrene</td> </tr> <tr> <td>Polymer</td> <td>poly(ethene)</td> <td>poly(propene)</td> <td>poly(chloroethene)</td> <td>poly(styrene)</td> </tr> </table>	Monomer	ethene	propene	chloroethene	styrene	Polymer	poly(ethene)	poly(propene)	poly(chloroethene)	poly(styrene)					
Monomer	ethene	propene	chloroethene	styrene													
Polymer	poly(ethene)	poly(propene)	poly(chloroethene)	poly(styrene)													
8c	Any answer from:	<table border="1"> <tr> <td>poisonous gases given off</td> <td>carbon monoxide given off</td> <td>greenhouse gases</td> <td>carbon given off</td> </tr> <tr> <td>toxic gases given off</td> <td>carbon dioxide made</td> <td>global warming</td> <td>soot given off</td> </tr> </table>	poisonous gases given off	carbon monoxide given off	greenhouse gases	carbon given off	toxic gases given off	carbon dioxide made	global warming	soot given off							
poisonous gases given off	carbon monoxide given off	greenhouse gases	carbon given off														
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9a	synthetic or artificial or man-made	Synthetic fertilisers are made by the chemical industry to increase the amount of food that can be grown to feed the world population.															
9b	nitrogen, potassium or phosphorus	Fertilisers are soluble compounds containing one or more from: potassium, phosphorus and nitrogen															
9c	Pesticides	<table border="1"> <tr> <td>Chemical</td> <td>How It Protect Plants</td> </tr> <tr> <td>Pesticide</td> <td>Protects plants from insects by killing insects</td> </tr> <tr> <td>Herbicides</td> <td>Kills weeds which reduce the nutrients in the soil</td> </tr> <tr> <td>Fungicides</td> <td>Protects plants from diseases which kill plants</td> </tr> </table>	Chemical	How It Protect Plants	Pesticide	Protects plants from insects by killing insects	Herbicides	Kills weeds which reduce the nutrients in the soil	Fungicides	Protects plants from diseases which kill plants							
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9d	Strong Weak	Molecules are held together by bonds that are strong. Molecules only have weak bonds between them.															
10a	fermentation or anaerobic respiration	Glucose is turned into ethanol (alcohol) and carbon dioxide by enzymes in yeast in an environment with no oxygen.															
10b	To speed up reaction	Catalysts speed up reactions without being used up in the reaction.															
10c(i)	38°C	Enzymes have optimum temperature and pH condition where they work fastest.															
10c(ii)	Any Answer from:	<table border="1"> <tr> <td>enzyme stops working</td> <td>enzyme denatured</td> <td>yeast stops working</td> <td>yeast destroyed</td> </tr> <tr> <td>doesn't work as well</td> <td>enzyme destroyed</td> <td>yeast denatured</td> <td>yeast is killed</td> </tr> </table>	enzyme stops working	enzyme denatured	yeast stops working	yeast destroyed	doesn't work as well	enzyme destroyed	yeast denatured	yeast is killed							
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11a	Margarine A	Margarine A has lower percentage of unhealthy saturated fats															
11b	Greasy mark on filter paper	<table border="1"> <tr> <td>Chemical</td> <td>Tested with</td> <td>Positive Test</td> </tr> <tr> <td>Starch</td> <td>iodine solution</td> <td>Turns blue/black</td> </tr> <tr> <td>Glucose</td> <td>warm Benedict's solution</td> <td>Turns orange/brick red</td> </tr> <tr> <td>Protein</td> <td>soda lime + heat</td> <td>Damp pH paper turns blue</td> </tr> <tr> <td>Fat</td> <td>filter paper</td> <td>Greasy mark on paper</td> </tr> </table>	Chemical	Tested with	Positive Test	Starch	iodine solution	Turns blue/black	Glucose	warm Benedict's solution	Turns orange/brick red	Protein	soda lime + heat	Damp pH paper turns blue	Fat	filter paper	Greasy mark on paper
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12a	Blue to brick red	Other acceptable answers: <table border="1"> <tr> <td>Blue to orange</td> <td>Blue to yellow</td> <td>Blue to brown</td> <td>Blue to red</td> <td>Blue to green</td> </tr> </table>	Blue to orange	Blue to yellow	Blue to brown	Blue to red	Blue to green										
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12b	caffeine	A drug alters the body from its natural state.
12c	10%	Percentage of daily calories = $\frac{\text{Calories in one can}}{\text{Recommended daily calorie intake}} \times 100 = \frac{200}{2000} \times 100 = 10\%$
13a	same volume of water in each test tube	The experiment is only a fair test if all the variables are kept the same except the variable that is being investigated
13b	temperature difference or starting and final temperature	The greater the change in temperature, the greater the energy given out.