



# JABchem



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# Past Papers Int 1 Chemistry

# 2005 Marking Scheme

Grade Awarded	Mark Required (/60)		% candidates achieving grade
A	42+	70%	14.4%
B	36+	60%	17.4%
C	30+	50%	22.7%
D	27+	40%	9.7%
No award	<27	<40%	35.9%

# 2005 Int 1 Chemistry Marking Scheme

MC Qu	Answer	% Pupils Correct	Reasoning										
1	C	34	<input checked="" type="checkbox"/> A Magnesium Oxide: magnesium + oxygen <input checked="" type="checkbox"/> B magnesium sulphate: magnesium + sulphur + oxygen <input checked="" type="checkbox"/> C magnesium sulphide: magnesium + sulphur <input checked="" type="checkbox"/> D magnesium sulphite: magnesium + sulphur + oxygen										
2	B	59	B has the least mass of copper sulphate (5g) B has the biggest volume of water (100cm <sup>3</sup> ) Most dilute solution will have lowest mass in the biggest volume of water										
3	A	56	Speed of Reaction: Catalysts speed up chemical reactions Mass of Catalysts left: 1g left as catalyst is not used up in reaction.										
4	B	60	<input checked="" type="checkbox"/> A Contains molecules but is an element (only one type of atom present) <input checked="" type="checkbox"/> B Contains molecules and is a compound (more than one kind of atom join) <input checked="" type="checkbox"/> C No molecules (ions present) <input checked="" type="checkbox"/> D No molecules (free atoms) and no compounds (only one kind of atom present)										
5	D	34	2 atoms of nitrogen (dinitrogen) and 4 atoms of oxygen (tetraoxide) gives a formula of N <sub>2</sub> O <sub>4</sub>										
6	A	75	The lower the pH the greater the acidity The higher the pH the greater the alkalinity										
7	D	43	Heating iron oxide with carbon produces iron metal and carbon dioxide gas. Other metals produced this way include: copper, lead and tin.										
8	A	69	melting point of magnesium = 650°C    melting point of calcium = 842°C <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Metal</th> <th>Melting Point</th> </tr> </thead> <tbody> <tr> <td>Aluminium</td> <td>660°C</td> </tr> <tr> <td>Gold</td> <td>1064°C</td> </tr> <tr> <td>Silver</td> <td>962°C</td> </tr> <tr> <td>Tin</td> <td>232°C</td> </tr> </tbody> </table>	Metal	Melting Point	Aluminium	660°C	Gold	1064°C	Silver	962°C	Tin	232°C
Metal	Melting Point												
Aluminium	660°C												
Gold	1064°C												
Silver	962°C												
Tin	232°C												
9	C	34	Magnesium is higher up reactivity series than iron so prevents it from corroding/rusting (p6 of data book list metals in order of rusting) Copper, lead and tin are all below iron in reactivity series so do not protect iron from rusting.										
10	D	18	The combination of metals with the biggest gap on p6 of the data book is the pair of metals which gives the biggest voltage.										
11	D	56	Terylene is a form of polyester and is a synthetic fibre. Silk, wool and cotton are all natural fibres.										
12	C	56	Petrol floats on water and makes petrol jump up when water is added to burning petrol.										
13	C	42	Biogas, release from decaying living material, is mainly methane gas.										
14	B	44	<input checked="" type="checkbox"/> A Cracking: Turn big molecules into more useful shorter molecules <input checked="" type="checkbox"/> B Distillation: Separating molecules with different boiling points <input checked="" type="checkbox"/> C Fermentation: Making alcohol and carbon dioxide from sugar <input checked="" type="checkbox"/> D filtration: Separating an insoluble solid from water										

15	A	63	Greenhouses require plastic that let light through to the plants Greenhouses require plastic that doesn't crack when hot Greenhouses require plastic light does not make the plastic brittle
16	C	49	Chlorophyll absorbs the light energy required for the process of photosynthesis
17	B	34	<input checked="" type="checkbox"/> A Iodine Test: Turns blue/black in the presence of starch <input checked="" type="checkbox"/> B Starch breaks down into glucose → Benedict's turns orange/brick red with glucose <input checked="" type="checkbox"/> C Heating with Soda Line: Release of alkaline gas shows protein was present <input checked="" type="checkbox"/> D Filter Paper Test: paper gets greasy in the presence of fat
18	B	87	<input checked="" type="checkbox"/> A Colourings: Improve the visual qualities of food <input checked="" type="checkbox"/> B Flavourings: Improve the taste of food <input checked="" type="checkbox"/> C Preservatives: Improves the keeping qualities of food <input checked="" type="checkbox"/> D Vitamins: Improves the nutritional qualities of food
19	D	49	Proteins are made from amino acid building blocks joined together
20	A	52	<input checked="" type="checkbox"/> A Fermentation: glucose → ethanol + carbon dioxide <input checked="" type="checkbox"/> B Photosynthesis: carbon dioxide + water → glucose + oxygen <input checked="" type="checkbox"/> C Polymerisation: monomer → polymer e.g. ethene → poly(ethene) <input checked="" type="checkbox"/> D Respiration: glucose + oxygen → carbon dioxide + water

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Long Qu	Answer	Reasoning										
1a	Saturated	When a solid dissolves in water, the particles go into the little spaces between the water molecules. When there are no little spaces left between the water molecules, no more solid will dissolve. The solution is now saturated and the extra solid lies on the bottom of the beaker.										
1b(i)	more dissolves	An increase in temperature increase the number of grams of which dissolves in 100cm <sup>3</sup>										
1b(ii)	52±1g	Graph reading problem solving question. Accept 51→53g										
2a	calcium chloride (1mark) water (½mark) carbon dioxide (½mark)	General Equation: acid + metal carbonates→salt + water + carbon dioxide hydrochloric acid + calcium carbonate→calcium chloride + water + carbon dioxide										
2b(i)	gas bubbling	Question is asking for the visual signs of the chemical reaction proceeding										
2b(ii)	B has smaller particle size	Smaller the particle size, the faster the reaction.										
3a	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th style="text-align: center;">pH</th> <th style="text-align: center;">acid/alkali/neutral</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">11</td> <td style="text-align: center;">alkali</td> </tr> <tr> <td style="text-align: center;">9</td> <td style="text-align: center;">alkali</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">acid</td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">neutral</td> </tr> </tbody> </table>	pH	acid/alkali/neutral	11	alkali	9	alkali	3	acid	7	neutral	<p>pH is obtained by looking up colour in table, and taking the colour obtained and using the 2<sup>nd</sup> diagram to turn it into a pH value.</p> <p>pH below 7 → acid,    pH above 7 → alkali,    pH = 7 → neutral</p>
pH	acid/alkali/neutral											
11	alkali											
9	alkali											
3	acid											
7	neutral											
3b	substances are insoluble	substances which have a pH must dissolve in water and form a solution first										
4a	D - A - B - C	<p>D 1<sup>st</sup> - A test tube was marked every two centimetres</p> <p>A 2<sup>nd</sup> - A piece of wet pH paper was placed at each mark</p> <p>B 3<sup>rd</sup> - Ammonia solution was dropped on to a small piece of cotton wool on a tile</p> <p>C 4<sup>th</sup> - test tube was placed over the cotton wool and a stopwatch was started.</p>										
4b	½marks awarded for:	<p>½ mark - correct label on y-axis</p> <p>½ mark - correct scale on y-axis</p> <p>½ mark - correctly drawn points</p> <p>½ mark - suitable line joining points</p>										
5a	to make drink fizzy or to give it bubbles	Carbon dioxide gas is dissolved in fizzy carbonated drinks										
5b	glucose	glucose is a sugar with a sweet taste										
5c	Any answer from:	<p>To prevent spoiling or</p> <p>To increase shelf-life or</p> <p>To stop drink going off</p>										
6a	hydrogen	general equation: metal + acid → salt + hydrogen										
6b(i)	volume greater than zinc (over 13cm <sup>3</sup> )	<p>Magnesium is more reactive than zinc. (p6 of data booklet)</p> <p>More reactive metals react faster and will produce more foam.</p>										
6b(ii)	Copper, mercury, silver or gold	The bottom four metals on p6 of data booklet do not react with acid										

7a	cannot be reshaped on heating	Thermosetting: materials which do not reshape when heated. Thermoplastic: materials which can be reshaped when heated.
7b	electrical conductor	all metals and alloy conduct electricity
7c(i)	alloy	alloys are mixtures of metals (sometime mixed with some non-metals too)
7c(ii)	40g	lead is 25% of Wood's metal $25\% \text{ of } 160\text{g} = \frac{25}{100} \times 160\text{g} = 40\text{g}$
8a	plastic will break down	Biodegradable plastics get broken down by bacteria. Non-biodegradable plastics do not get broken down by bacteria.
8b	harmful/poisonous gases may be formed	Plastics can release the following toxic/poisonous gases when burned: carbon monoxide, hydrogen cyanide, hydrogen chloride
8c	oil is a finite resource or may run out	Fossil fuels like coal, oil and natural gas are non-renewable, finite energy source. They take millions of years to form and cannot be replaced once used.
9a	500cm <sup>3</sup> ( $\frac{1}{2}$ mark) 2.5g ( $\frac{1}{2}$ mark)	Fair test: Same volume of water used in each experiment Fair test: same weight of each washing powder used in each experiment.
9b(i)	40°C±1°C	Graph reading problem solving question
9b(ii)	Enzymes do not work at high temp (denature)	Enzymes work best at ~37°C. At higher temperatures the enzymes does not work anymore and denatures.
10a	kill weeds	Pesticides are used to control pests Fungicides are used to control bacteria and fungi Herbicides are used to control weeds
10b	toxic or poisonous	
10c(i)	Manure or compost	Any naturally obtained fertiliser: manure, compost, slurry, dung, seaweed
10c(ii)	potassium, nitrogen or phosphorus	The three essential elements for plant growth are potassium, nitrogen and phosphorus
11a	turns lime water milky	Test for Carbon Dioxide: CO <sub>2</sub> turns limewater milky
11b	photosynthesis	Photosynthesis: carbon dioxide + water → glucose + oxygen
11c	Greenhouse effect, Global warming or Hotter temperatures	The increase in CO <sub>2</sub> in the atmosphere is causing the planet to warm up. Increased burning of fossil fuels and cutting down rainforests have caused the amount of CO <sub>2</sub> in the atmosphere to increase.
11d	carbon monoxide	Incomplete combustion produced carbon monoxide (gas) and carbon/soot (solid) when there is not enough oxygen for complete combustion.
12a	Diagram containing:	Sugar on burning spoon below a boiling tube containing water and a thermometer $\frac{1}{2}$ mark: water & thermometer in test tube $\frac{1}{2}$ mark: sugar on burning spoon 1mark: Apparatus arranged properly
12b	oxygen	burning uses up oxygen gas