



JABchem



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Past Papers

Standard Grade

General

Chemistry

2006

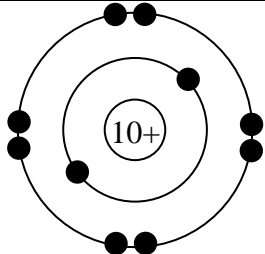
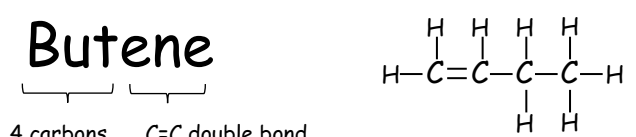
Marking Scheme

2006 General	KU		PS	
	/30	%	/30	%
3	20+	67%	24+	80%
4	15+	50%	20+	67%
5	12+	40%	18+	60%
7	<12	<40%	<18	<60%

2006 Standard Grade Chemistry General Marking Scheme

Question	Answer	Chemistry Covered						
1a	A	Answer	A	B	C	D	E	F
		Element	potassium	gold	magnesium	copper	zinc	calcium
		Symbol	K	Au	Mg	Cu	Zn	Ca
1b	C	Answer	A	B	C	D	E	F
		Element	potassium	gold	magnesium	copper	zinc	calcium
		Date of Discovery	1807	ancient	1775 <small>(old data booklet)</small>	ancient	ancient	1808
1c	E	Galvanising: coating iron in zinc so zinc protects iron by sacrificial protection						
1d	F	Answer	A	B	C	D	E	F
		Element	potassium	gold	magnesium	copper	zinc	calcium
		Flame Colour	lilac	not listed in data booklet	not listed in data booklet	blue-green	not listed in data booklet	orange-red
2	B+E Both for 1 mark	Fair Test		Factor		B	E	
		Factor which is changing:		Temperature	20°C	40°C		
		Factors kept constant:		Particle Size	powder	powder		
				Concentration	1mol/l	1mol/l		
3a	B+D Both for 1 mark	Answer	A	B	C	D	E	F
		Hydrocarbon	butene	methane	hexene	pentane	pentene	propene
		Homologous Series	alkene	alkane	alkene	alkane	alkene	alkene
3b	B	Ethane C ₂ H ₆ is cracked and the product must be either ethene C ₂ H ₄ or methane CH ₄						
3c	C	Answer	A	B	C	D	E	F
		Hydrocarbon	butene	methane	hexene	pentane	pentene	propene
		Boiling Point (°C)	-6	-162	63	36	30	-48
4	C	<input checked="" type="checkbox"/> A Dilution of acids with water raises the pH of acid up to pH=7 <input checked="" type="checkbox"/> B All solutions become less concentrated/more dilute when water is added <input checked="" type="checkbox"/> C Acids have a pH below pH=7 and diluting the acid raises the pH up to pH=7 <input checked="" type="checkbox"/> D Adding water to acids dilutes them and raises the pH up to pH=7						
5a	B	Two different metals in a cell will produce a voltage. The same metal attached to itself in a cell gives zero voltage.						
5b	D	Magnesium and copper are furthest apart combination of metals in Electrochemical series (p10 data booklet) and give the highest voltage						
6a	A	Answer	A	B	C	D	E	F
6b	E	Description	pure element	mixture of elements	pure compound	pure compound	pure compound	mixture of compounds
6c	A+B Both for 1 mark	Type of Molecule	no molecules present	no molecules present	penta-atomic molecules	tetra-atomic molecules	diatomic molecules	mixture of molecules
7a	E	A: respiration: C ₆ H ₁₂ O ₆ + 6O ₂ → 6CO ₂ + 6H ₂ O B: fermentation: C ₆ H ₁₂ O ₆ → 2C ₂ H ₅ OH + 2CO ₂						
7b	D	C: filtration: separating residue (insoluble solid) in filter paper from filtrate (solution) D: photosynthesis: 6CO ₂ + 6H ₂ O → C ₆ H ₁₂ O ₆ + 6O ₂						
7c	A,B 1 mark each	E: distillation: separation of two liquids with different boiling points F: cracking: breaking larger hydrocarbons into smaller, more useful hydrocarbons						
8	A,D 1 mark each	<input checked="" type="checkbox"/> A metals e.g. copper conduct electricity in the solid state <input checked="" type="checkbox"/> B glucose is covalent. Covalent solutions do not conduct electricity <input checked="" type="checkbox"/> C sulphur is a non-metal and covalent substances do not conduct electricity. <input checked="" type="checkbox"/> D ionic chloride is an ionic solution. Ionic solutions conduct electricity.						



Question	Answer	Chemistry Covered				
		Gas	Hydrogen	Oxygen	Carbon Dioxide	
9a	turns lime water milky	Gas Test	Burns with a pop	Relights glowing splint	Turns lime water milky	
9b	less time taken	Smaller particle size after crushing makes reaction faster, making gas pressure inside tub increase faster				
9c	$C_6H_8O_6$	Problem Solving Question				
10a	nucleus	nucleus is positively charged because it contains positive protons and neutral neutrons				
10b(i)		Electrons will form 4 pairs of electron in outer shell of neon to give electron arrangement 2,8				
10b(ii)	noble gases	Group	1	7	0	Between Groups 2+3
		Name	alkali metals	halogens	noble gases	transition metals
11a	It will run out	finite means it will eventually run out sometime in future				
11b(i)	$\frac{1}{2}$ -organisms die + fall to bottom of sea $\frac{1}{2}$ -organisms get covered up by sand $\frac{1}{2}$ -layers of rock increase pressure $\frac{1}{2}$ -millions of years later turns into oil	Step	How Coal is Made	How Crude Oil is Made		
		1	Dead trees fall to bottom of swamp	Dead sea organisms fall to bottom of sea		
		2	Materials get covered up by mud	Materials get covered up by sand		
		3	Layers of rock above provide pressure	Layers of rock above provide pressure		
		4	Over millions of years turns into coal	Over millions of years turns into crude oil		
11b(ii)	Residue	Residue is the heaviest fraction from crude oil				
11c	poisonous SO_2 formed or acid rain will be formed	Sulphur in coal burns to form SO_2				
12a	bar chart showing:	$\frac{1}{2}$ mark vertical scale	$\frac{1}{2}$ mark correct labelling of bars	1 mark bars drawn correctly		
12b(i)	potassium or phosphorus	Fertilisers are soluble compounds which contain at least one of: Nitrogen, Potassium and/or Phosphorus				
12b(ii)	solubility	All nitrates are soluble and fertilisers must be soluble				
12c	root nodules	Nitrifying bacteria in Root Nodules of Leguminous plants like pea family plants, bean family plants and clover contain the ability to fix atmospheric nitrogen into nitrate compounds.				
13a	lead, nitrogen and oxygen	Ending	Meaning	Example		
		-ide	2 elements in compound	Copper sulphide = copper + sulphur		
		-ate	2 elements in compound + oxygen	Copper sulphate = copper + sulphur + oxygen		
		-ite	2 elements in compound + oxygen	Sodium sulphite = sodium + sulphur + oxygen		
13b(i)	lead iodide	lead nitrate solution + potassium iodide solution \longrightarrow potassium nitrate solution + lead iodide (precipitate)				
13b(ii)	Filtration	Insoluble solid precipitates are removed from solution by filtering. The precipitate is the residue which collects in the filter paper and the solution is the filtrate that goes through the filter paper.				
14a	medium or slow	Reactivity of halogens decreases down group 7.				
14b(i)	C_4H_8	<p style="text-align: center;">Butene</p> 				



14b(ii)	bromine solution is decolourised	bromine solution decolourises quickly in the presence of C=C double bonds. This indicated the substance being tested is unsaturated.																							
15a	Table showing:	<table border="1"> <thead> <tr> <th>Gas</th> <th colspan="3">Use</th> </tr> </thead> <tbody> <tr> <td>helium</td> <td colspan="3">airship</td> </tr> <tr> <td>neon</td> <td colspan="3">advertising signs</td> </tr> <tr> <td>argon</td> <td colspan="3">light bulbs</td> </tr> <tr> <td>krypton</td> <td colspan="3">lasers</td> </tr> </tbody> </table>				Gas	Use			helium	airship			neon	advertising signs			argon	light bulbs			krypton	lasers		
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15b	atomic size increases	As the atomic number increases the atomic size increases.																							
15c	hydrogen is flammable	Hydrogen burns violently to form water, helium does not burn.																							
16a	ammonia nitrogen monoxide oxygen sulphuric acid	Problem Solving: transfer of information from passage to flow chart																							
16b	NO ₂	<table border="1"> <thead> <tr> <th>Prefix</th> <th>mono-</th> <th>di-</th> <th>tri-</th> <th>tetra-</th> </tr> </thead> <tbody> <tr> <td>Meaning</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Example</td> <td>carbon monoxide</td> <td>carbon dioxide</td> <td>sulphur trioxide</td> <td>carbon tetrachloride</td> </tr> </tbody> </table>				Prefix	mono-	di-	tri-	tetra-	Meaning	1	2	3	4	Example	carbon monoxide	carbon dioxide	sulphur trioxide	carbon tetrachloride					
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17a	non-biodegradable or does not rust or will last longer	Plastic will last longer as it does not break down and will not rust.																							
17b	not occurring in nature or man-made	All plastics are man-made/synthetic																							
17c	gases produced are poisonous	<table border="1"> <thead> <tr> <th>Poisonous Gas</th> <th>Carbon monoxide</th> <th>hydrogen cyanide</th> <th>hydrogen chloride</th> </tr> </thead> <tbody> <tr> <td>Source</td> <td>burning plastics</td> <td>burning polyurethane</td> <td>burning PVC</td> </tr> </tbody> </table>				Poisonous Gas	Carbon monoxide	hydrogen cyanide	hydrogen chloride	Source	burning plastics	burning polyurethane	burning PVC												
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18a	A	lowest pH ∴ most acidic ∴ most ions present ∴ highest current will flow																							
18b	5-15	must be below 20																							
18c	one from:	<table border="1"> <tbody> <tr> <td>volume of acid</td> <td>voltage</td> <td>type of electrode</td> </tr> <tr> <td>temperature of acid</td> <td>same power supply</td> <td>distance between electrodes</td> </tr> <tr> <td>depth of solution</td> <td>same size beaker</td> <td>size of electrodes</td> </tr> </tbody> </table>				volume of acid	voltage	type of electrode	temperature of acid	same power supply	distance between electrodes	depth of solution	same size beaker	size of electrodes											
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19a	to complete circuit	electrolyte must be an ionic/salt solution																							
19b	silver then gold	silver is higher up electrochemical series than gold so electrons flow from the higher metal (silver) to the lower metal (gold)																							
19c(i)	Alloys	Mixtures of metals are called alloys																							
19c(ii)	<p>A pie chart representing the composition of an alloy. The largest sector is labeled 'Gold (75%)', the medium sector is 'Copper (20%)', and the smallest sector is 'silver (5%)'.</p>	<p>Gold 75% and Silver is 5% ∴ remaining 20% is copper Biggest sector must be gold Smallest sector must be silver Medium sector must be copper</p>																							

