

Chemistry A

General Certificate of Secondary Education

Unit **A323/01**: Ideas in Context plus C7 (Foundation Tier)

Mark Scheme for June 2011

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MARK SCHEME:

Question			Answer	Mark	Guidance
1	a	i	any two from: lighter; better performance / more powerful; longer lifetime / keep charge longer;	2	allow faster allow travel further
		ii	£4000 (1)	1	
		iii	idea that much more lithium is required to make car batteries than smaller batteries (1) idea that there are likely to be more electrically powered cars in the future (1)	2	ignore reference to laptops/mobile phones unless qualified allow idea that more environmentally friendly cars will be used in the future for second mark
	b		lithium compounds are toxic (1) so could cause pollution as mined/extracted/disposed of (in landfill) (1) OR electricity used to recharge the batteries/extract the lithium must be generated (1) electricity generation causes pollution (1) OR lithium has to be mined/dug out of ground (1) this causes environmental damage (1)	2	second mark cannot be scored without the first allow description of environmental damage
	c	i	(lithium ions) move apart/out of lattice / are free to move (1)	1	
		ii	(lithium ions) move / attracted to negative electrode / turn into lithium atoms (1)	1	allow chloride ions move/turn into atoms allow move to opposite charge
	d	i	lithium is very reactive / lithium reacts with oxygen/water in the air (1)	1	
		ii	any method to exclude air/water e.g. oil, vacuum, cover, inert gas (1)	1	
	e		add each to cold water / oxygen or air (1) see how (violently) each reacts (1)	2	allow 'see how they react with water/ air' for 2 marks
Total				[13]	

Question		Answer	Mark	Guidance
2	a	hydrocarbons (1) unreactive (1)	2	
	b	C_2H_6 <pre> H H H-C---C-H H H </pre> <p><u>propane</u></p> <pre> H H H H-C---C---C-H H H H </pre>	4	one mark for each of the four correct responses spelling of propane must be correct for this mark for molecular formula there must be a clear difference between upper case of C and H and smaller 2 and 6 all bond lines must be shown in structural formulae
	c	carbon dioxide (1) water (1)	2	
	d	exothermic (1)	1	
Total			[9]	

3	a	ethanoic acid; octanol; sulfuric acid;	2	all three correct = 2 marks two correct = 1 mark
	b	ethanoic acid + octanol \rightleftharpoons octyl ethanoate + water (1)	1	either order, both required
	c	they are reversible / they are equilibrium reactions (1)	1	allow 'can be changed back into the original reactants'
	d	any two from: perfumes; solvents; plasticisers;	2	
Total			[6]	

Question		Answer	Mark	Guidance
4	a	for quality control / to match information on the label / to ensure product is safe to use / to ensure product is effective / so that it does not cause damage (to kettle) / so that chemical is not wasted	1	no mark for 'safety' unqualified accept to prevent possibility of litigation
	b	i	3	one mark each for C before E; E before D; D before B
		ii	2	ignore idea of increasing reliability unless average/mean is mentioned ignore idea of more accurate do not allow idea that it reduces the errors/outliers do not allow ideas about comparing different batches
		iii	1	allow easier to add a little at a time
		iv	3	allow 'to see if there is acid still there' for 1 mark
	c	i	1	
		ii	2	two marks for correct answer without working
		iii	1	allow answers 1.2, 1.22 and 1.23 allow ecf from (i) and (ii)
Total			[14]	

Question			Answer	Mark	Guidance
5	a	i	method 1 (1)	1	
		ii	ethene is obtained from crude oil (1) will one day run out (1)	2	allow finite resource
	b		in method 2 there is competition in the use of feedstock/corn/land for food and to make ethanol (1) method 3 uses feedstock/waste/ biomass that would otherwise be thrown away/ has no other uses (1) competition between different uses of the same feedstock/land leads to price increase/ where there is no competition prices should not rise (1)	2	allow reverse argument that method 3 does not compete for food supply to get the second mark the answer must say more than just that method 3 uses waste material
Total				[5]	

Question			Answer	Mark	Guidance
6	a	i	aspirin (1)	1	
		ii	made on a small scale (1)	1	allow high purity / high value
	b	i	sulfur + oxygen → sulfur dioxide (1)	1	reactants in either order allow correct symbol equation
		ii	catalyst (1)	1	
		iii	provides an alternative route (1) with a lower activation energy (1)	2	ignore reference to it being a catalyst ignore reference to bond breaking
	c	i	Amy (1)	1	
		ii	Jeff (1)	1	
Total				[8]	

Paper Total				[55]	
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