

Additional Applied Science A

General Certificate of Secondary Education

Unit **A335/02**: Harnessing Chemicals (Higher Tier)

Mark Scheme for June 2011

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Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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1 Abbreviations, annotations and conventions used in the detailed Mark Scheme.

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
not	= answers which are not worthy of credit
reject	= answers which are not worthy of credit
ignore	= statements which are irrelevant
allow	= answers that can be accepted
()	= words which are not essential to gain credit
<u> </u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW	= alternative wording
ora	= or reverse argument

Question		Expected Answer	Mark	Rationale/Additional Guidance
1	a	Health & Safety Executive/HSE	1	
	b	i butane	1	allow correct formula
	b	ii ammonia; potassium hydroxide	2	allow correct formulae either order
	b	iii potassium sulfate ; water	2	allow correct formula either order
	b	iv butane	1	allow correct formula
	b	v ammonia	1	allow correct formula
	c	idea that 1 litre = 1000 ml / 5x10; 50 (g/l)	2	correct answer 50 (g/l) = 2 marks
Total			[10]	

Question		Expected Answer	Mark	Rationale/Additional Guidance
2	a	advantage: operates 24 hours / low labour cost / faster / more produced per day / product made constantly / no need to stop / clean out equipment disadvantage: high start-up / equipment cost	2	reject cheaper ignore contamination
	b	speeds up the reaction; not used up / chemically unchanged / can be reused	2	ignore "doesn't affect the reaction" ignore reference to laboratory equipment
	c	gives out heat (to surroundings) / increases temperature	1	
	d	change/increase/decrease temperature / pressure	1	allow : change concentration reject change amount (of reagents) reject catalyst
Total			[6]	

Question		Expected Answer	Mark	Rationale/Additional Guidance
3	a	any correct example of a solid mixture	1	examples: tablet / lo-salt / packet cake mix / baking soda / dry concrete mix reject alloy / paracetamol / sugar / salt / sand / concrete
	b	to <u>stop</u> or <u>prevent</u> separation; into two layers	2	ignore allow liquids to mix allow "binds liquids together" ignore references to bonding
	c	suspension	1	
Total			[4]	

Question		Expected Answer	Mark	Rationale/Additional Guidance
4	a	any two from: use of renewable resources / availability of resources; (use of less) energy; (produce less / recycle) <u>waste</u> ; (maximise) yield	2	ignore pollution ignore safety
	b	(lots of) research and development testing / ensure drug is safe / effective	1	ignore : chemicals are expensive
	c	i	1	allow any indication of correct formula
	c	ii	2	reject reference to homologous series
	d	(12x8) + (1x9) + (14x1) + (16x2); 151	2	correct answer of 151 = 2 marks
Total			[8]	

Question		Expected Answer	Mark	Rationale/Additional Guidance
5	a	PbSO ₄ ✓	2	
		MgCO ₃ ✓		
	b	to wash off / dissolve / remove (soluble) impurities / reagents / other products	2	ignore: cleaning /purifying
	c	<input type="text"/> + HCl → <input type="text"/> + HNO ₃	2	fully correct formulae only
	d	(6/7.5) x 100; 80%	2	correct answer of 80% = 2 marks
		Total	[8]	
		Paper Total	[36]	

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