

Additional Applied Science A

General Certificate of Secondary Education

Unit **A335/01**: Harnessing Chemicals (Foundation Tier)

Mark Scheme for June 2012

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Annotations

Used in the detailed Mark Scheme:

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	answers that can be accepted
(words)	words which are not essential to gain credit
words	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	no benefit of doubt

	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Question			Answer	Marks	Guidance										
1	(a)	(i)	Ca	1											
		(ii)	Na ₂ SO ₄	1	correct subscripted numbers										
		(iii)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td>compound</td><td>✓</td></tr> <tr><td>hydrocarbon</td><td>✓</td></tr> </table>							compound	✓	hydrocarbon	✓	2	
compound	✓														
hydrocarbon	✓														
	(b)	(i)	<table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: 1px solid black; padding: 2px;">solid</td> <td rowspan="3" style="font-size: 2em; vertical-align: middle;">}</td> <td style="border: 1px solid black; padding: 2px;">solid in liquid</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">emulsion</td> <td style="border: 1px solid black; padding: 2px;">liquid in liquid</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">suspension</td> <td style="border: 1px solid black; padding: 2px;">solid in solid</td> </tr> </table>	solid	}	solid in liquid	emulsion	liquid in liquid	suspension	solid in solid	2	three lines correct = 2 marks one or two lines correct = 1 mark			
solid	}	solid in liquid													
emulsion		liquid in liquid													
suspension		solid in solid													
		(ii)	any two suitable examples eg salad dressing; milk etc	2											
	(c)	(i)	solute; solution	2	answers must be in the correct order.										
		(ii)	5/250 (x 1000); 20 (g/litre)	2	correct answer with no working scores both marks										

Question		Answer	Marks	Guidance																								
2	(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td style="background-color: #cccccc;"></td> <td></td> <td></td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td></td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>											✓							✓		✓					3	mark each row independently.
				✓																								
					✓																							
	✓																											
	(b)	any named acid/alkali indicator; correct colour change	2																									
	(c) (i)	hydrochloric acid + sodium hydroxide (1) sodium chloride + water (1)	2	reagents in either order (accept correct formulae) products in either order (accept correct formulae)																								
	(ii)	magnetic stirrer; "flea"	2	allow stirring rod(1) ignore spatula, spoon etc																								
	(iii)	swirl (contents of flask)	1	accept shake etc. reject stirring (rod) ignore emulsifier																								
	(d)	idea of (partial) evaporation of water; way of causing evaporation (heating/leaving etc); idea of time/cooling/etc to make crystals	3	ignore issues of crystal size heat solution gently, until volume of solution decreases by half, for two marks accept suitable description																								
	(e)	sodium carbonate with sulfuric acid; calcium hydroxide with phosphoric acid	2	each pair may be in either order																								
	(f) (i)	not pure enough / contains sand / contains grit	1																									
	(ii)	too expensive	1																									
	(iii)	different purity / quality	1																									

Question			Answer	Marks	Guidance										
3	(a)	(i)	fine means small scale (production/manufacture); bulk means large scale (production/manufacture)	2											
		(ii)	<table border="1"> <tbody> <tr> <td>ammonia</td> <td>✓</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>sodium hydroxide</td> <td>✓</td> </tr> <tr> <td>sulfuric acid</td> <td>✓</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	ammonia	✓			sodium hydroxide	✓	sulfuric acid	✓			2	all boxes correct = 2 marks one/two correct = 1 mark
ammonia	✓														
sodium hydroxide	✓														
sulfuric acid	✓														
	(b)		5.1 / 34 (x 100); 15%	2	correct answer with no working scores both marks										
Paper Total				[36]											

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