OCR
RECOGNISING ACHIEVEMENT

GCSE

Additional Applied Science A

General Certificate of Secondary Education

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

Mark Scheme for January 2011

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Question			Expected Answers	Marks	Additional Guidance
1	(a)		C anywhere before B; (1) B anywhere before E; (1) E anywhere before F; (1)	[3]	CBEF
	(b)		idea of using a funnel; (1) idea of pouring down a glass rod; (1)	[2]	**reject**: filter paper **ignore** pipette/burette **allow** pour down thermometer
	(c)		sodium chloride; (1)	[1]	**allow** correct formula do **not** allow wrong use of lower/upper case letters
	(d)		water; (1)	[1]	**allow** correct formula do **not** allow wrong use of lower/upper case letters
	(e)		idea of 1000ml = 1litre/100ml = 0.1 litre OR 2.5/0.1 OR 2.5x10 (1) 25 (g/l) (1)	[2]	correct answer of 25 = 2 marks
			Total	[9]	
2	(a)		idea of disappearance of/change in amount of reactant/appearance of product; (1) per unit time; (1)	[2]	**allow** (time for) complete reaction / reaction to stop (1)
	(b)	(i)	hydrogen; (1)	[1]	**allow** correct formula (H_2) do **not** allow H
		(ii)	arrangement that would make and collect some gas;(1) apparatus that would collect all gas safely; (1)	[2]	apparatus should collect gas in syringe or over water with no leaks for both marks
	(c)		idea of initially steeper line; (1) new line starts at 0,0 with max at 80cm^3; (1)	[2]	tolerance ±½ square.
	(d)		idea of speeds up the reaction; (1) idea of not used up in the reaction; (1)	[2]	**allow** slows down/changes rate **reject** 'does not take part in the reaction' **allow** lowers activation energy **allow** does not change amount of product
			Total	[9]	

Question			Expected Answers	Marks	Additional Guidance
3	(a)		HNO_3 + NaOH (1) $NaNO_3$ + H_2O (1)	[2]	correct formula for both reactants in any order; (1) both correct products in any order; (1) **ignore** any attempts at balancing
	(b)		idea of use of pH meter;(1) pH changes to 7 (or below);(1) use of named indicator eg universal indicator;(1) correct colour (change) for named indicator/ pH7 or below for UI;(1)	[2]	 **accept** value below pH7 **allow** pH paper
	(c)		idea of 23+23 +32+(4x16) (1) 142 (1)	[2]	correct answer of 142 = 2 marks
	(d)	(i)	idea of dissolves (in a solvent)	[1]	
		(ii)	evaporate / heat solution to reduce volume; (1) then crystals form on standing/cooling; (1)	[2]	
			Total	[9]	
4	(a)		made/extracted from living/once lived sources; (1)	[1]	**allow** contains carbon
	(b)	(i)	A;	[1]	**allow** C_4H_{10} (correct formula only)
		(ii)	C;	[1]	**allow** CH_3COOH /$C_2H_4O_2$ (correct formula only)
	(c)		ethyl ethanoate; (1) water; (1)	[2]	either order
	(d)		refluxing; (1) distilling; (1)	[2]	answers need to be correct way round
	(e)		advantage - ideas of simpler equipment used/ low capital or start up costs/ equipment can be used to make other chemicals/ limits contamination; (1) disadvantage - ideas of lower productivity/ high labour cost / high energy cost; (1)	[2]	**ignore** unqualified references to cost/waste/pollution **allow** easier quality control for second mark advantage and disadvantage must be on different issues.
			Total	[9]	
			Paper Total	[36]	

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