



Rewarding Learning

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Chemistry

Unit A2 1: Practical Manual

Sample Results and Observations



Practical 1.1

Investigating the effect of changing concentration on the rate of a chemical reaction (spec ref 4.3.7)

Volume of $\text{Na}_2\text{S}_2\text{O}_3(\text{aq})$ / cm^3	Volume of water / cm^3	Concentration of $\text{Na}_2\text{S}_2\text{O}_3(\text{aq})$ / mol dm^{-3}	Volume of HCl / cm^3	Time taken / s	$\frac{1000}{t}$
10	0		4	66	
8	2		4	85	
6	4		4	115	
5	5		4	141	
4	6		4	178	
2	8		4	443	

Practical 1.2

Investigating the effect of changing concentration on the rate of a chemical reaction (spec ref 4.3.7)

Time sodium hydrogencarbonate added / s	Initial Burette Reading / cm^3	Final Burette Reading / cm^3	Titre / cm^3	Moles of sodium thiosulfate	Moles of iodine	Concentration of Iodine / mol dm^{-3}
60			11.5			
300			10.3			
660			8.9			
960			7.7			
1260			6.8			



Practical 1.3

Investigating the effect of changing concentration on the rate of a chemical reaction (spec ref 4.3.7)

Mixture	Volume of potassium iodide solution / cm ³	Volume of water / cm ³	Volume of sodium thiosulfate solution / cm ³	Volume of starch solution cm ³	Volume of potassium peroxodisulfate(VI) solution / cm ³	Time / s
1	5	0	2	1	2	80
2	4	1	2	1	2	100
3	3	2	2	1	2	150
4	2	3	2	1	2	230
5	1	4	2	1	2	400

Practical 2.1

Making buffer solutions and investigating their pH values (spec ref 4.5.5)

Buffer	pH	pH on addition of HCl(aq)	pH on addition of NaOH(aq)
1	4.75	4.72	4.78
2	3.75	3.72	3.78
3	9.25	9.22	9.28



Practical 2.2

Determining the shape of a titration curve (spec ref: 4.5.6)

Volume of sodium hydroxide / cm ³	pH
0.0	1.00
2.0	1.07
4.0	1.14
6.0	1.21
8.0	1.29
10.0	1.37
12.0	1.45
14.0	1.55
16.0	1.65
18.0	1.79
20.0	1.95
22.0	2.20
24.0	2.69
24.5	3.00
25.0	7.00
25.5	11.00
26.0	11.29
28.0	11.75
30.0	11.96
32.0	12.09
34.0	12.18
36.0	12.25
38.0	12.31
40.0	12.36



Practical 2.3

Determining the pH of salts (spec ref: 4.5.8)

Salt	pH
Sodium chloride	7
Sodium ethanoate	Greater than 7
Ammonium chloride	Less than 7
Ammonium ethanoate	~7

Practical 3.1

Preparation of 2,4-dinitrophenylhydrazones
(spec ref: 4.7.8)

Practical 3.2

Using Fehling's solution and Tollens' reagent to distinguish between aldehydes and ketones
(spec ref 4.7.9)

Carbonyl compound	Observation with Fehling's solution	Observation with Tollens' reagent
Ethanal	Blue solution changes to a red precipitate	Silver mirror forms
Propanone	Blue solution remains	Colourless solution remains

Practical 4.1

Preparing a carboxylic acid from an alcohol (spec ref 4.8.3)

Test	Observations
Smell	Vinegary/sharp smell
Universal indicator paper	Turns red/orange
Sodium carbonate	Effervescence



Practical 4.2

Carrying out test tube reactions of a carboxylic acid with sodium carbonate, sodium hydroxide and aqueous ammonia and measuring pH changes (spec ref 4.8.5)

	Observations
Reaction with sodium carbonate	Initial pH 2-3 Effervescence Solid disappears Increase in pH
Reaction with sodium hydroxide	Initial pH 2-3 Increase in temperature Increase in pH
Reaction with ammonia	Initial pH 2-3 Smell disappears Increase in pH

Practical 5.1

Preparing a liquid ester from a carboxylic acid and an alcohol (spec ref 4.9.5)

Practical 6.1

Preparation of methyl 3-nitrobenzoate (spec ref 4.10.5)

Mass of measuring cylinder and methyl benzoate / g	
Mass of emptied measuring cylinder / g	
Mass of methyl benzoate / g	4.30
Mass of methyl 3-nitrobenzoate / g	2.60
Melting point of methyl 3-nitrobenzoate / °C	