METHODIST GIRLS' SCHOOL
CHEMISTRY PRELIMS 2024
Paper 3

Question	Skill	Indicative Material	Mark	Total
1(a)	MMO PDO	Conducting the titration experiments *Results Table*: Record all burette readings for full set of experiments in the table to nearest 0.05 cm^3 Calculate the volume of **Q** used in each set of experiment correctly MMO Results: A full set of data is recorded showing 2 sets of consistent titration readings of 22.00 cm^3 within 0.20 cm^3 of each other. Volumes of R within 0.20 cm^3 of Supervisor's results (Note for teachers: solutions to be standardised to obtain 22.00 cm^3 of **Q** from titration)	 1 1 1 1 1	[5]
1(b)	ACE	Calculate the average volume of **Q** used correctly based on 2 consistent readings.	1	[1]
1(c)	ACE	Calculate the number of moles of KIO_3 using concentration in mol/dm^3 and 25.0 cm^3 of solution used in titration. Calculate the number of moles of I_2 correctly using mole ratio of KIO_3 : I_2 = 1:3	1 1	[2]
1(d)	ACE	Calculate the number of moles of R correctly using mole ratio of I_2 : R = 1 : 1	1	[1]
1(e)	ACE	Calculate the mol/dm^3 of R from (d) and volume of titre Calculate the relative molecular mass of R correctly using g/dm^3 and mol/dm^3.	1 1	[2]

Total : [11]

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2(a)	PDO	Vertical axis – independent variable Horizontal axis - dependent variable Axis labels + units appropriate scale, more than 50% of graph Points correctly plotted (allow only 1 error), include point of origin Straight line of best fit	1 1 1 1	[4]
2(b)	ACE	Change in temperature/ decrease in temperature increases with number of moles of C.	1	[1]
2(c)	ACE	Value (with unit) from the graph with unit and marking shown on both x and y axes.	1	[1]
2(d)	PDO	Show calculation for number of moles of C Show recording of initial temperature, final temperature temperature change with correct unit.	1 1	[2]
2(e)	ACE	Graph shows a trend based on 5 temperature readings (data points)	1	[1]
2(f)	P	Variables to be controlled : volume of solvent, temperature, speed of stirring , dry beaker Independent variable : type of solvent Dependent variable : maximum mass of the organic acid that has dissolved Add a known mass of solid organic C + stir to dissolve completely Continue adding until no more of the solid organic acid dissolves	1 1 1 1 1	[5]

3(a) Test 1	NMO	White solid turned yellow / orange when hot white solid when cold	1 1	[2]
Test 2	NMO	Bubbles of gas formed Gas formed white ppt in lime water. Carbon dioxide evolved.	1	[1]
Test 3	NMO	White ppt Ppt dissolves in excess to form colourless solution	1	[1]

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Test 4	NMO	White ppt Ppt dissolves in excess to form colourless solution	1	[1]
Test 5	NMO	Dirty green ppt, ppt insoluble in excess, Upon standing, reddish brown/orange ppt formed on the surface	1 1	[2]
Test 6	NMO	Yellow / light brown solution formed Bubbles of colourless, odourless gas evolved. Gas relights/ rekindles a glowing splint. Oxygen gas given off. Reddish brown ppt, Ppt insoluble in excess	1 1 1	[3]
Test 7	NMO	White ppt Ppt insoluble in acid / ppt remains	1	[1]
Test 8	NMO	Purple solution decolourizes / turns colourless	1	[1]
3(b)	ACE	$ZnCO_3$	1	[1]
3(c)	ACE	It acts as a reducing agent. It reduces the purple $KMnO_4$ to colourless Mn^{2+} .	1 1	[2]

Total : [15]

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