X/30

SHURE JOINT MOCK 2024

UCE CHEMISTRY PAPER 2 SCORING GUIDE

	Basis of assessment	Assessment criteria	Scoring
i) Key word, heat change	AIM OF THE EXPERIMENT	An experiment to investigate the heat changes that occur when substances A, B and C dissolve in water (enthalpy of solution)	02
	Variables of the experiment. Key without fixed/constant	i) Dependent variable: Temperature change / temperature of the solution ii) independent variable: Different substances A, B and C iii) controlled variables: Fixed volume of water OR Fixed mass of substances A, B and C used	03
	Hypothesis	Substances A, B and C dissolve in water with evolution (liberate) of heat exothermically. Or Substance A, B and C dissolve in water with absorption of heat endothermically.	02
	Materials used	Thermometer, 3 beakers, electronic balance, 100cm3 measuring cylinder,	03
	Procedures (Procedures must be stated in Past simple tense / Past tense) deny for the Procedures stated in Present tense / any other tense	a) ~~100~~cm3 of distilled water is measured using a measuring cylinder, and is placed in a plastic beaker and its initial temperature noted; b) 2g of substance A is measured using an electronic balance and added to plastic beaker and the mixture is stirred using a thermometer to dissolve and maximum or minimum temperature is noted; d) procedures (a) and (b) are repeated for substances B and C;	04 Deny marks for wrong tense
	Risks and mitigation any 1 risk and Mitigation	Risk: Breakage of thermometer Mitigation: Putting the thermometer in the case after use Risk: solutions pouring on the skin ~~or the question paper~~ Mitigation: put on lab (laboratory) coat, gloves, closed shoes / PPE	02
ii) Mass recorded to 1 or 2 dps. Temperature must be recorded to 1 dp. Volume of water recorded to 1 dp and Consistent / Constant	Presentation of data	substance: A: Mass used(g) 2.0; volume of water used (cm3) 100.00; Initial temperature of water (°C) 25.0; Final temperature of solution (°C) 30.0 / B: 2.0, 100.00, 25.0, 24.0 / C: 2.0, 100.00, 25.0, 26.0	12
		Interpretation of results Assumptions: Density of solution = 1g/cm3	

1+6+2

	Award the mark on Calculation whose volume of water	SHC of solution = $4.2^{o}Cg^{-1}k^{-1}$ Quantity of heat evolved or absorbed Heat loss or gain to/from the surrounding is negligible A: $H = mc\Delta\Theta$ Mass of solution = volume of water × density = (100 × 1) g = 100g ✓ $\Delta\Theta$ = Final temperature – initial temperature = (30.0-25.0) °C = 5 °C 02 H = (100 × 4.2 x 5) J = 2100J or 2.1 kJ ∴ The heat evolved is 2.1KJ ✓ B: $H = mc\Delta\Theta$ Mass of solution = volume of water × density = (100 × 1) g = 100g $\Delta\Theta$ = initial temperature – final temperature = (25.0-24.0) °C = 1°C ✓ 02 H = (100 × 4.2 x 1) J = 420J or 0.42 kJ The heat absorbed is 0.42KJ ✓ C: $H = mc\Delta\Theta$ Mass of solution = volume of water × density = (100 × 1) g = 100g ✓ $\Delta\Theta$ = Final temperature – initial temperature 02 = (26.0-25.0) °C = 1.0 °C H = (100 × 4.2 x 5) J = 420J or 0.42 kJ ✓ The heat liberated is 0.42KJ	
iii)	Conclusion	Substance A and C dissolves in water exothermically ✓ Substance B dissolve in water endothermically ✓	02