

2023 6092 EOY SEC 4 PAPER 3 PREPARATION LIST – Jasmine Zheng

Overview

S/N	Apparatus/Chemical	S/N	Apparatus/Chemical
1	250 cm ³ of 1.50 mol/dm ³ aqueous hydrochloric acid solution, labelled solution P	15	Bench reagents of (i) aqueous sodium hydroxide solution, (ii) aqueous nitric acid solution, (iii) aqueous silver nitrate and (iv) limewater
2	120 cm ³ of 0.700 mol/dm ³ aqueous sodium carbonate solution, labelled solution Q (prepared by dissolving ~200.2 g of solid Na ₂ CO ₃ ·10H ₂ O in 1000 dm ³ of de-ionised water)	16	1 × thermometer, covering the range 0°C to 100°C graduated in degrees Celsius
3	5 g of solid anhydrous sodium carbonate in a covered transparent plastic container, labelled sample X	17	1 x 100 cm ³ measuring cylinder
4	2 g of solid nickel(II) chloride in a test-tube, labelled sample Y	18	1 x 250 cm ³ glass beaker
5	Methyl orange indicator	19	1 × large Styrofoam cup
6	1 × 50 cm ³ burette	20	1 × digital stopwatch
7	1 × burette clamp and the retort stand	21	3 × test-tubes
8	1 × 25.0 cm ³ pipette	22	1 x delivery tube
9	1 × pipette filler	23	1 x lighter
10	1 × filter funnel	24	1 x test-tube holder
11	1 × white tile	25	safety goggles
12	1 × clean dropper	26	wooden splints
13	1 × 250 cm ³ conical flask	27	litmus paper (both blue and red)
14	1 × bottle of de-ionised water	28	weighing balance
		29	access to paper towels

For Question 1

In addition to the fittings ordinarily contained in a chemical laboratory, the apparatus and materials specified below will be necessary.

Each candidate will need the following:

- (a) 100 cm³ of 1.50 mol/dm³ aqueous hydrochloric acid solution, labelled **solution P** (similar concentration for Question 2 as well);
- (b) 120 cm³ of 0.700 mol/dm³ aqueous sodium carbonate solution, labelled **solution Q** (prepared by dissolving ~200.2 g of solid Na₂CO₃·10H₂O in 1000 dm³ of de-ionised water);
- (c) Methyl orange indicator;
- (d) 1 × 50 cm³ burette;
- (e) 1 × burette clamp and the retort stand;
- (f) 1 × filter funnel;
- (g) 1 × white tile;
- (h) 1 × clean dropper;
- (i) 1 × 25.0 cm³ pipette;
- (j) 1 × pipette filler;
- (k) 1 × 250 cm³ conical flask;
- (l) 1 × bottle of de-ionised water;
- (m) safety goggles and
- (n) access to paper towels

25.0 cm³ of solution **Q** should require the addition of **between 22.00 – 24.00 cm³** of the solution **P** from burette at equivalence point.

For Question 2

In addition to the fittings ordinarily contained in a chemical laboratory, the apparatus and materials specified below will be necessary.

Each candidate will need the following:

- (a) 5 g of solid anhydrous sodium carbonate in a covered transparent plastic container, labelled **sample X**;
- (b) 150 cm³ of 1.50 mol/dm³ aqueous hydrochloric acid solution, labelled **solution P** (similar concentration for Question 1 as well);
- (c) 1 x 100 cm³ measuring cylinder;
- (d) 1 x 250 cm³ glass beaker;
- (e) 1 x large Styrofoam cup;
- (f) 1 x glass rod;
- (g) 1 x thermometer, covering the range 0°C to 100°C graduated in degrees Celsius;
- (h) 1 x digital stopwatch;
- (i) 1 x bottle of de-ionised water;
- (j) weighing balance;
- (k) safety goggles and
- (l) access to paper towels

When solid **X** is added to 100 cm³ of hydrochloric acid, there should be a measurable temperature rise.

For Question 3

In addition to the fittings ordinarily contained in a chemical laboratory, the apparatus and materials specified below will be necessary.

Each candidate will need the following:

- (a) 2 g of solid nickel(II) chloride in a test-tube, labelled **sample Y**;
- (b) Bench reagents of (i) aqueous sodium hydroxide solution, (ii) aqueous nitric acid solution, (iii) aqueous silver nitrate and (iv) limewater;
- (c) 2 × test-tubes;
- (d) 1 × glass rod;
- (e) 1 x delivery tube;
- (f) 1 x lighter;
- (g) 1 x test-tube holder;
- (h) 1 × bottle of de-ionised water;
- (i) wooden splints;
- (j) litmus paper (both blue and red);
- (k) safety goggles and
- (l) access to paper towels