

Chemistry practical marks come from two things: writing down exactly what you SAW, and setting out a table and a graph properly. The commonest lost mark in the whole paper is writing a conclusion where an observation was asked for.

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Writing observations

Say what you saw, not what it means – “A white precipitate formed” is an observation. “It contains chloride ions” is a conclusion. If the question says observations, write only the first kind.

Give the colour and the state – Say pale blue precipitate, green solution, colourless gas. “It changed” and “a reaction happened” earn nothing.

Include everything that happened – Bubbles (effervescence), the tube getting warm, a smell, a solid disappearing, a colour fading. Each can be a separate mark.

Test with excess as well – When adding sodium hydroxide or ammonia, write what happens at first AND what happens when you keep adding. The pair of results is what identifies the substance.

The results table

Headings with units – Write temperature/°C or volume/cm³ at the top of the column, never beside each number.

Same decimal places – A thermometer marked in whole degrees gives 24.0 °C, so every value in that column has one decimal place. A burette gives two: 24.50 cm³.

Leave space for repeats – Plan the table before you start, with rows for each repeat and a row for the mean.

Titration and volume work

Read the burette correctly – Read the bottom of the meniscus at eye level, to the nearest 0.05 cm³. Record the initial and final readings, then subtract to get the titre.

Which titres to average – Use only the titres that are within 0.10 cm³ of each other. Never include the rough titration in the average.

Show every step – Moles of the known solution, then the ratio from the equation, then the answer. Each line can earn a mark on its own.

Graphs and conclusions

Choose the scale – Fill more than half the grid. Use 1, 2 or 5 units per square, and label both axes with the quantity and the unit.

Line of best fit – One straight line with a ruler or one smooth curve, not a zigzag joining every point. Circle any point that clearly does not fit.

Describe with numbers – “The temperature rose from 21 °C to 34 °C over the first 20 seconds and then stayed constant” – quote the values from your own results.

Safety, errors and improvements

Hazard plus precaution – Name both together: dilute acid is irritant, so wear eye protection; the beaker will be hot, so use tongs. A hazard on its own is half an answer.

Name the error precisely – “Some solution was left in the pipette” or “heat escaped from the open beaker” are real errors. “Human error” is not.

Match the improvement to the error – For heat escaping: use a lid and insulate the beaker. For colour judgement: use a white tile under the flask so the end point is easier to see.

The write-up in order

What you did, in numbered steps, with the amounts you used.

A table with headings, units and the same decimal places down each column.

Observations written as what you saw, then conclusions written separately.

Any calculation set out line by line with units.

One hazard with its precaution, one error with its improvement.