ANSWERING TIPS FOR CHEMISTRY PAPER 63

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1. Read the questions correctly. For eg, if the question says "give two observations besides the temp change", don't include temperature change in your answer.

2. Check for contradictions within your answer. For eg, a common error is, write "*a white insoluble precipitate dissolves*" – This sentence is obviously incorrect, incomplete and vague!

   This is how the former sentence should be worded – to show the presence of cations such as Zn^{2+} and Al^{3+} in an unknown solution: "*white precipitate formed* (✓) *is dissolved in excess of aqueous sodium hydroxide* (✓) *and produces colourless solution* (✓)".

3. "Describe what you would observe", write down what you see, hear or feel (eg 'test tube gets hot'). A common mistake: "gas is given off" or "copper is deposited". These are not observations, they are conclusions instead.

4. "Describe what you would see", don't make observations about sounds or temp!!

5. When drawing labelled diagrams:
   - ensure diagram is drawn in the space given and is labelled
   - diagram for gas measurement – make sure that the gas can't escape!! For eg, don't draw a gas syringe with the plunger much smaller than the syringe barrel – this's a common error!

6. Plotting graph of Reaction Rate: you must draw a smooth line (new term for the 'curve of best fit' or 'best fit line') (equal number of points on each side of the curve). You will not get a mark if you use a ruler for plotting a best fit curve.
   For plotting graph:
   Unless instructed otherwise, the independent (manipulated) variable should b plotted on the x-axis whereas the dependent (responding) variable plotted on the y-axis. Points on the graph should be clearly marked as crosses or encircled dots. Large 'dots' are penalised.

7. Avoid vague statements. For eg, the use of graphite :
   This is the answer given by a student – *Graphite is used in electrolysis*. This should be worded as *Graphite is used as electrodes in electrolysis*.

8. Look out for phrases such as 'chemical test' or 'physical test' – don't just focus on the word 'test'.
   For eg, a chemical test for water is *turns anhydrous copper(II) sulfate from white to blue*.
   A physical test for water is '*boiling point* ✓ *of 100'C* ✓ which is also the test for the purity of water!!
   If you are asked "how to test for the purity of water?" Ans: *boiling point 78'C* (✓) & *compare the result with the known data* (✓).

9. **The tests for ammonium ion and nitrate ion are <u>commonly confused</u>!!**
   <u>Both</u> require heating with aqueous sodium hydroxide,
   but to test for nitrate ion, you will need to add Aluminium foil/powder besides the heating the sample solution with aqueous sodium hydroxide.
   You don't need to do this for the ammonium ion. The result for both ions is the gas released has a <u>pungent</u> odour which turns <u>damp/moist red litmus paper to blue</u> and the gas is ammonia. Please REMEMBER!!

10. Test for HCl gas with litmus paper, **DON'T** give the same result as Cl_2 gas.
    At this time, you should know the results of these tests for HCl and Cl_2 gases (please see pg 20 of Chapter 1 Acid, Base & Salt module)

11. Difficulty in explaining the definition of Rate Of Reaction, ROR:
    It's *A change in selected quantity (change in mass/volume) over **a fixed period of time***.
    Students always omit the sentence in bold!

12. Remember that the total volume of gas released by the same amount (mass/size/length) of metal is always the **same**.
    A common mistake is to say that the powdered metal, when reacted with acid, gives off more gas than larger lumps of the same amount of metal.
    Volume of gas released/ given off should be the **same**. The difference is the powdered metal, when reacted with acid has a higher ROR!!

13. The total volume of gas released by a catalysed reaction is exactly the **same** as for an uncatalysed reaction. The same amount of reactants is the important factor!

14. For ROR questions, when asked to analyse graphs of volume of gas against time for the reaction of acid with a metal/metal carbonate, a common error is mentioning the volume of gas is increasing and not mentioning the ROR. Remember that the ROR is decreasing with time as the reaction proceeds because ROR = $\frac{difference\ in\ volume\ of\ gas}{time\ taken}$

15. What does the symbol "aq" mean?
    Answer "aqueous" alone isn't enough to fetch you 2 marks! You must include
    Solution ✓ *formed when solute dissolved in water* ✓
    Additional info: bromine at room temperature is liquid but once it's displaced from KBr (aq) by Cl_2 (g) {see pg 11 of Yr10 Chapter 4 Periodic Table module} then bromine will be in aqueous state. If bromine liquid is diluted with water, then bromine will be in aqueous state.

16. Question 3 Qualitative Analysis of unknown salt : when asked to describe the appearance of a substance, remember that there are generally two points to be made: the colour and the physical state.

REMEMBER: Always use the colours given in the syllabus for Testing for Ions.

For eg:

Flame tests for Na^+ & Cu^{2+} are yellow and blue green respectively.

Cr^{3+} is green precipitate in little aqueous sodium hydroxide but it's grey green precipitate in a little aqueous ammonia.

Cu^{2+} is light blue precipitate when a little of aqueous sodium hydroxide or aqueous ammonia is added; but *light blue precipitate is dissolved in excess of aqueous ammonia and produces* ***dark blue solution***.

17. 'Test the pH' means 'give the pH number' – do not write something is acidic or alkaline.

18. Bar charts - should be drawn when one of the variables isn't numerical. They should be made up of narrow blocks of equal width that do not touch!!

19. Questions like these are very popular from Question 2 (graph question) in Paper 6 :

- "*Suggestion and a reason for improvement/checking reliability of results to the experiment*" and "*Suggest how the reliability of the results could be checked*"

  Repeat the experiment, take the average ✓ and compare the results ✓

- "*Advantage and disadvantage of using a burette/pipette or a measuring cylinder in measuring the volume of solution*"

  Burette/ pipette :

  Advantage: Measure the volume of solution/ liquid more accurately.

  Disadvantage: The speed of discharging the solution is very slow.

  Measuring cylinder :

  Advantage: Fast/ easy/ convenient.

  Disadvantage: Inaccurate in measuring the volume of solution/ liquid.

- *"Suggest one change to the apparatus used which could be made to obtain more accurate results and a reason for the change"*

  The question is focusing on the apparatus, so you can't repeat the experiment!

  Change of apparatus: Measuring cylinder to a burette/pipette // analogue stop clock to a digital stop clock // metal cup changed to a plastic cup (measuring the change in temperature) // imprecise thermometer.

  Reason: More accurate in measuring the volume of solution // more accurate in measuring the time // reduce heat loss to the surrounding / cover the plastic cup with a lid (measuring the change in temperature) // precise thermometer (digital).

- *"Suggest possible source of error(s). Suggest improvement(s) to reduce the source of error(s)"*

  The answer for this question will depend on the type of experiment given!

  Error: Use of measuring cylinder // Use of any metal container // Imprecise thermometer used // Experiment only done once // Reading taken every 1 minute.

  Improvement: Use of burette/ pipette // Use of plastic cup with a lid // Use a precise thermometer (digital) // Repeat the experiments, take the average and compare the results // Reading taken at a much shorter interval (30 s)

- *"When doing experiments, what would be the advantage of taking the temperature readings every 15 seconds?"*

  There will be more readings/ data ✓ to enable us to plot a better/ smoother graph ✓ (in order to analyse the trend of the results).

20. Question 2 (graph question) in Paper 6 :

- *Why is conical flask used instead of a beaker?* [IGCSE May/Jun 2016 Paper 62 no 2(f)]

  Easy to swirl the contents of the flask without spillage!

- *Why is this point anomalous?* => the point is much further away (further up or down) from the line or curve.

  Answer depends on the experiment!!!

  Example of this is, Sri KL Year 10 Year End Exam Paper 6, 2016; will send it to you ONLY if you are interested!!

21. Why is the baseline drawn using a pencil instead of an ink pen for chromatography?

The pencil is insoluble in the solvent (not acceptable!). The pencil is obviously insoluble in the solvent!

It should be worded as *The pencil **mark** or the pencil **line** is insoluble in the solvent*.

22. For the last question, no. 4 descriptive question:

Read what the question wants and include whatever chemicals/apparatus listed in the question as your answer. Your first statement (first step) of answer is very important!

If you are unsure of what volume of solution/liquid or mass of a solid to specify, use an unknown variable; for eq, V_1 cm^3 or X gram respectively.

ALWAYS include a conclusion – brief comparison of results in your last step of answer.