

CHEMISTRY

SUBJECT 9189

PAPER 6

GENERAL COMMENT

Generally candidates performed well on the first part of the examination paper. There was evidence of adequate preparation in quite a number of centres. Some centres, however, performed poorly due to lack of preparation and practice. It is important for teachers to note that such words or phrases like: milky white precipitate, partially soluble, colloidal solution, gelatinous suspension, white solution, cloudy solution, oily solution, solution dissolves in excess, etc, are vague and not acceptable as descriptions of colours of precipitate and solutions. It is important for candidates to always familiarise themselves with the standard terminology on the description of colours of precipitates printed on the Qualitative Analysis notes in the syllabus.

COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

(a) (i) Generally well done except for the deductions. Poor candidates failed to observe in detail because they had not added sodium hydroxide in excess as instructed at the beginning of the question thereby deducing Cr^{3+} instead of Fe^{2+} . Careless candidates observed a blue precipitate for Cu^{2+} but these were very few.

(a) (ii) Most candidates failed to make comments on the colour of the filtrate and residue thereby losing marks unnecessarily. Some poor candidates observed 'a damp red litmus paper turning blue' without indicating that it was a gas or ammonia gas which led to that observation. Even so, very careless candidates observed the change due to the presence of an alkali, the reagent they had added earlier (sodium hydroxide).

Some candidates deduced NO_3^- or NO_2^- instead of ammonium ion NH_4^+ forgetting that they had not added aluminum foil.

(b) Generally well done. Candidates lost marks on the issue of solubility.

(c) Most candidates described the observation as a 'clear colourless' solution instead of 'no apparent change'. Teachers need to emphasize to candidates that even a coloured solution with no precipitate is also clear. The absence of $\text{CO}_3^{2-}/\text{NO}_2^-$ or SO_3^- on addition of hydrochloric acid which gave a negative test was not done by most candidates.

On addition of barium chloride, some candidates deduced the presence of SO_3^{2-} ion instead of the SO_4^{2-} ion, little did they know that the acid they had added earlier would be used to test the solubility of the precipitate formed and hence insolubility of the SO_4^{2-} precipitate.

(d) Generally well-done by most candidates though some candidates observed an off-white/cream precipitate thereby deducing bromide instead of chloride. This may have been due to supervisors preparing solutions too early before the examination of which the solution became brownish due to aerial oxidation of Fe^{2+} ions. Supervisors should follow instructions on preparing solutions so as not to disadvantage candidates.

The identification of ions in the summary must have been supported by deduction made earlier and not just guess work or copying for the marks to be awarded.

Question 2

This question was generally poorly done. Candidates failed to give a proper sequence of steps in designing the experiment. Those who did use such reagents as $Pb(NO_3)_2$ and HNO_3 acid which were not listed despite the instructions having said so. Some stated the use of sodium hydroxide, a sure sign that candidates did not know that it is used to test for cations. A more appropriate design was to add $AgNO_{3(aq)}$, then ammonia solutions in excess, followed by filtration and addition of $AgNO_3$ to the filtrate. The location of ions was to be either in precipitate or solutions instead of the test tube as stated by poor candidates.

Candidates also failed to tabulate the information but rather used continuous prose. Candidates are reminded of the need to follow instructions given in the question paper whenever they are attempting questions.