AQA
Realising potential

A-level
Chemistry

CHM3X Investigative and Practical Skills in AS Chemistry
Report on the Examination

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Task 1

The concerns that were raised by a very few centres about the difficulty of performing the titration with sufficient accuracy were addressed by widening the tolerances for the accuracy marks and allowing comparison with both the Teacher Value and Class Average. As it turned out, almost all centres were able to carry out the experiment successfully. Most students scored the P, C and R marks but there are still some who throw away these relatively easy marks by not making sure of these points.

It is important that Teacher Result Sheets are completed for each class and that the set labels are clear and consistent. “Mr Smith” may well teach the “Y12 Set 2”, but the examiner isn’t to know this.

Task 2

There were few ‘perfect’ scores (24/24) – with the majority of students scoring 5 in the accuracy section and thus 7 in this Task. Effervescence was the most frequently missed observation. Few students scored fewer than 4 marks. Sadly, some marks were lost for poor description rather than making the wrong observation. For instance, “White solution” cannot be credited. Similarly, “no reaction” and “no observation” cannot be used in place of “no visible change”. Contradictory responses were also penalised, eg “No visible change with a cream precipitate”.
Some students were close to losing the R mark when their “table” was more like a list of individual statements.

Written Test

Section A

Question 1 was done well – although a small number of students gave their answer to only 1 dp or averaged all their titres, both concordant and non-concordant. In question 2 a small number of students got the wrong solution in the pipette. Some used the titre from question 1 and then divided by it again. The final multiplication by a factor of 1000/25 proved more difficult. Some failed to spot that the dilution factor was x50 in question 3. This was marked consequentially on the answer to question 2, so many students gained this mark. However it was lost if the answer was only given to one significant figure, a minimum of two was required. Question 4 was reasonably well answered. In question 5 the key idea was “equilibrium”, and not many got this. Where this was done well, it tended to be the ‘entire Centre’. In question 6 the challenge here was to appreciate that it is the appearance of a precipitate with the acidified reagent that shows a positive result. Students should be encouraged to read the EMPA tasks and their results carefully during the Written Test, particularly as the written paper may be taken some considerable time after the practical tasks. Where necessary, a student’s unexpected observations for Task 2 were taken into consideration. For question 7, although many scored M1 for choosing “E”, fewer gave satisfactory explanations for M2. In question 8(a), most managed to do this well but some gave the silver salt instead. A name was ignored unless it contradicted a formula. In question 8(b) lots of possible answers were allowed here and most scored well. Perhaps through not reading the question thoroughly, a significant few gave silver nitrate solution as the reagent. If ammonia solution was given, it was important to specify whether it was to be used as a dilute or concentrated solution. Concentrated sulfuric acid could have been be used, but it was only appropriate to add it to the filtered solid.

Section B

It has long been a requirement that the scale should be chosen so that the plotted points cover more than half the printed grid in both directions. In question 9(a) many students failed to do this. A significant few chose a difficult scale to work with....and consequently frequently misplotted one or more of the points. The line was often penalised for "doubling", being too thick or, in quite a few cases, just not being done. Questions 9(b) + 9(c) were generally done well. Question 9(d) was generally done well, although a few students were penalised (once per paper) for a rounding error. Question 9(e) was mostly done well and errors were carried forward where there was sufficient working to show what the student had intended. Question 9(f) was also marked consequentially, but students needed to use their figures rather than simply restate the question. Question 9(g) proved to be quite tricky. Students who failed to divide by two for the mole ratio incurred a two mark penalty (for a chemical error), but could gain M3 for an otherwise correctly worked answer given to 3 significant figures. In question 9(h), the key idea was that water would be released. In question 9(i) many students referred, incorrectly, to "keeping the fire away" from the wood.

Section C

In question 10, the first mark (more water) was gained by many, although some suggested a volume larger than the calorimeter. Few managed to give a clear explanation, even though some seemed to have the right kind of idea but couldn't express it sufficiently clearly. In question 11(a) many suggested something that was already shown on the diagram. A few lost the mark by stating "acid" rather than stating a reagent. In question 11(b), the key idea was that the dichromate(VI) was being reduced. Oxidation of the alcohol was often given as the answer. As with Q5, there were notable differences in student performance depending on the centre, with, often most students in certain Centres getting the mark. In question 11(c), most correct answers were for "better control of temperature" rather than what we thought was the more obvious flammability of the alcohol. Question 11(d) was generally answered well. The most common error being to omit the word "precipitate" in the result of the Fehling's Test.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.

UMS conversion calculator www.aqa.org.uk/umsconversion