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Chemistry CHEM2

(Specification 2420)

Unit 2: Chemistry In Action

Report on the Examination

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General Comment

Full marks were seen on every question and there was no evidence that candidates ran out of time to complete the paper. The lower achieving candidates had ample opportunity to show what they could do and the higher achieving had adequate challenge.

The demand of the paper was comparable with previous examinations and the scheme of marking carried forward standards.

As in previous papers, many candidates would have scored higher marks had they been able to write correct chemical formulas and construct balanced chemical equations.

Section A

Question 1

This question was not as high scoring as might have been expected. Candidates were unfamiliar with the equations that show how chlorine atoms catalyse the decomposition of ozone, even though these are in the specification. The ability to articulate a correct argument using Le Chatelier's principle in part (c)(ii) was well done, although candidates should be urged to refer to the "equilibrium" rather than the "system".

Question 2

The curve in part (a)(i) had an easy mark and a more demanding one and only 53% scored full marks. In part (a)(ii), many candidates did not appreciate that an increased likelihood of particle collision is not the same as an increase in the number of successful collisions. The explanation of how a catalyst increases the rate of a reaction was well known.

Question 3

This question discriminated well, although incomplete and incorrect reagents were common. Follow-on marks were awarded when an incomplete reagent was given but no marks were awarded when an incorrect regent was given as this was a chemical error.

Question 4

Part (a) was quite well answered, but the equation in part (b) caused significant problems. In part (c), it was the formula for copper(II) oxide that proved difficult for some candidates. Only 54% were able to write the correct simplest ionic equation in part (d)(ii).

Question 5

In this question many candidates gave incorrect formulae for magnesium ions, magnesium hydroxide, magnesium chloride, titanium oxide and titanium(IV) chloride and stated incorrectly the role of magnesium in titanium extraction. Only a minority of the candidates were able to see that the use of water on burning magnesium would produce hydrogen gas and that this would add to the fire hazard.

Question 6

Most candidates were able to have a go at this question and score some marks. The bonding in CO_2 was generally known, as was the idea that the infrared spectrum for carbon dioxide might have been expected to show an absorption in the range 1680 to 1750 cm^{-1} signifying the presence of a carbonyl bond but that this absorption was not present. In part (b)(i), answers rarely mentioned the "atmosphere" which is referred to directly in the specification and is essential to explain the answer correctly.

Question 7

Candidates had little difficulty with all of part (a), although incorrect equations showing hydrogen as a product were seen in part (a)(v). Part (b)(i) required a clear explanation that the electron density of the double bond induced a dipole in the bromine molecule. The remainder of this question was relatively high scoring.

Question 8

It was surprising to see that the term "nucleophile" was still not well known when all that was required was "an electron pair donor". Part (a)(ii) was well answered but part (a)(iii) was answered surprisingly poorly given that a similar question was included on the paper in June 2010. The remainder of this question was well answered by most candidates.

Section B

Question 9

Candidates still do not routinely draw correct displayed formulas when required and only 17% were able to write a complete equation for the oxidation of butan-1-ol. The calculations in parts (b) and (c) were both relatively well done, although only 27% scored full marks for the definition in part (c)(i) on which part (c)(ii) was based. The explanation in part (d)(i) proved to be the most difficult question on the paper and only the best candidates were able to score marks. The ideas of heat loss and incomplete combustion were not well known in part (d)(ii).

Question 10

This was a well answered question with the challenge increasing from part (b)(ii) onwards. The idea of the equilibrium shifting to replace lost HClO was understood by the better candidates and many correct equations were seen in parts (c)(i) and (c)(ii). In part (c)(iii), the stock answer that referred to relative size of the ions and attraction by the nucleus for the outer level electrons was accepted even though a more sophisticated answer might have been anticipated from at least some of the very large number of candidates who were taking a resit of this examination during their second year after GCSE.

Mark Ranges and Award of Grades

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