edexcel

Examiners' Report/ Principal Examiner Feedback

January 2015

Pearson Edexcel International A level in Chemistry (WCH06)

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

January 2015
Publications Code IA040474

Overall Impressions

The paper seemed to be well received. There were no questions that were consistently left blank, though there were some questions on areas of the specification which were less familiar to the students.

There were many excellent responses from centres where practical work is given the priority needed but there were also students who showed little experience of working in laboratories.

Individual Questions

Question 1

Part (a)(i). This was a straightforward start with a test that most students enjoy carrying out. Better students gave full accurate responses gaining full credit. Weaker students omitted one or more important aspects. For example students forgot the use of nichrome wire. (Though it is intriguing that so many centres seem to use platinum wire.) Others left out the concentrated hydrochloric acid or used other mineral acids. The most common problem was failure to place the wire coated in salt and acid into a (roaring) **Bunsen** flame (at the top of the blue cone).
Very few failed to give the formula for sodium ions, though some omitted the charge in (ii).

Part (b)(i) was only answered correctly by about one eighth of the students, and led to problems with part (iii) and (iv). This reaction is clearly mentioned on page 15 of the User Guide but had not been seen by most students. More students managed part B as they had used this as a test for the reduced product sulfate(IV) and the correct formula was allowed as a rescue mark but was not commonly seen. All sorts of familiar salts were offered. The frequency of correct response was consistent with part (i).

Question 2

The responses to part (a) resembled 1 (a)(i) in terms of marks. There were many excellent responses but weaker students gave ammonium chloride forms as a white precipitate or solid rather than a white smoke or dense white fumes.
The distillation in (b)(i) was well known but here were many errors like leaving the still head open, or sealing all the apparatus, or failing to draw a condenser jacket or getting the water flow the wrong way round. In (ii) the name, structural or displayed formula of ethanoic acid was needed. General responses did not answer the question sufficiently. In (c)(i) the formula was often correct but the name gave more problems – ethylamide was a common wrong response. Acetamide would have been accepted. In (ii) molecular formulae were not acceptable but often used.

Question 3

Though it was not expected that students would have necessarily done a titration while keeping the mixture hot, better students had no difficulty applying their skills correctly in (a)(i). Some omitted a thermometer or thermostat. There were problems with (ii) because of failure to read the question which stated excess zinc had been used. The ease of oxidation, by oxygen in the air, of lower oxidation state transition metal ions did not seem to be well known in (iii). Surprisingly few knew that acidified potassium manganate(VII) was self-indicating in (iv).
The calculation in (b) was challenging to complete. The first three parts were on well-trodden ground and gave few problems to better students. Weaker students were not sure what to do with the extra 50 cm^3 of potassium manganate(VII) in (ii). In (iv) better students either remembered form the colour or worked out that vanadium(II) formed. The best students gave a clear well-reasoned calculation. The common resource of weak students was to recalculate the oxidation numbers of manganese and on arriving at five electrons decided that vanadium must have formed as a metal!
Part (c) was correctly answered by about half the students by applying their skills at balancing ionic equations involving oxidation number changes.
Part (d) proved as challenging as most electrode potential questions in the past. The best answers showed real understanding of electrode potential by recognising that tin would only reduce vanadium ions with and electrode potential which was more positive. Most carried out appropriate cell calculations which was not needed but was rewarded.

Question 4

The preparation of liquid crystals is an excellent example experiment in the specification.

In part (a) a graduated 1 cm^3 pipette is the best apparatus to use. In future this method of measuring small volumes like this, this will need to be known.
The symbols in (b) were known by about three quarters of students. Answers like harmful/dangerous were too vague for the first.
Responses to the calculations in (c) were better than in the past. The common errors were an inability to round up correctly with better students. Weaker students struggled to work out the number of moles of a liquid from a volume.
The problem with methods of cooling was many responses used the addition of ice or cold water to the mixture in (d).
The ready reaction of an acyl chloride with an alcohol was often forgotten in part (e).
As usual the description of recrystallization gave the full range of marks almost equally spread, in (f). Many just referred to 'the solvent' rather than ethyl ethanoate or omitted to say it was hot. Washing with **minimum volume of / cold** solvent was omitted and a method of drying often forgotten.
Failure to read the question cost the majority of students both marks in (g). The question calls for a comparison. Good answers said the melting temperature of the pure sample would be sharp**er**. Poor answers trotted out measure the melting temperature and compare with the data source.

Advice to students

- Carry out the experiments
- Consider why a procedures are being used
- Consider how and why procedures work
- Read the question carefully

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London WC2R 0RL