

CHEMISTRY

SUBJECT 9189

PAPER 2

GENERAL COMMENT

There was a general improvement in the handling of calculations by candidates. As a result more marks were scored in question 1. However, in the majority of centres, it appeared as though candidates were not well prepared for the Organic Chemistry section. Of concern to the examiner is the fact that candidates failed to use appropriate Chemistry terms and terminology. This resulted in them losing marks in question 2.

COMMENTS ON INDIVIDUAL QUESTIONS

Question 1

Although 80% of the candidates were able to give the correct equation, very few identified starch as the appropriate indicator. Most candidates were able to state the state symbols. Phenolphalein and methyl orange were the most frequent suggestion for indicator. As a result only 10% of the candidates got the mark for question 1(c). In question 1(g) the majority of candidates commented on quenching the reaction rather than the fact that iodine sublimes gas to solid.

(d) (ii) $4,5 \times 10^{-4}$

(d) (i) $2,25 \times 10^{-4}$

(e) $n(\text{HI}) = \frac{0,23}{128}$ $n(\text{HI}) \text{ decomposed} = 4,5 \times 10^{-4}$
 $N(\text{HI}) \text{ remaining} = 1,35 \times 10^{-3}$

(f) $K_c = 2,8 \times 10^{-2}$

Question 2

Less than 20% of the candidates scored the maximum marks for this question. In question 2(a)(i), the common mistake was for candidates to refer to the Beryllium atom (Be) and not the Beryllium ion (Be^{2+}) as being very small and having great polarizing power.

Question 2(a) (ii). The decrease in solubility down the group is related to the trends in enthalpies of hydration and lattice which were to be explained in terms of the increase in cationic radii and constant ionic size of the sulphate.

In question 2 (b), although candidates were generally able to state the uses they were not always able to give the correct properties on which the uses were based.

Question 2 (c), 90% of the candidates identified Ba (OH)₂ but only a few gave the correct explanation. They failed to calculate the solubility of Ba (OH)₂, using $\sqrt[3]{k_{sp}}$ instead of $\sqrt[3]{k_{sp}/4}$.

Question 3

(a) (i) At least 50% of the candidates gave the correct definition for electrolysis. A few candidates lost the mark by failing to state breakdown or decomposition.

(ii) Although 80% gave the correct products at each electrode, some lost marks on the equations. A common error was putting the reversible sign on equations,.

(iii) Whilst the majority of candidates were able to draw the diagram correctly, a few drew the diaphragm cell. Another error was connecting the voltmeter in series.

$$\begin{aligned} \text{(b)} \quad & 0.54/_{108} = 0.005 \\ & 1/4 \times 0.005 = 0.00125 \\ & 0.00125 \times 22.4 = 0.028 \text{ dm}^3. \end{aligned}$$

Question 4

(a) (i) The reagent and products were correctly stated. A large number of candidates failed to give the conditions.

(b) 75% of candidates lost marks because the O-H bond was not displayed. Some 30% of candidates had no idea of positional isomerism.

Only candidates who were able to answer question 4 (b) were able to give the correct test to identify the alcohols.

Question 5

80% of candidates scored 6 marks and above on this question. In question 5(a) candidates drew instead of stating the functional group and were penalized. The hydroxyl and alkene functional groups were wrongly stated as alcohol and double bond respectively.

(b) (i) The organic compound dissolves in sodium hydroxide.

(b) (ii) Instead of stating that the colour changed from orange to green, some weak candidates only stated one colour or imply that the colour changes. The product was sometimes given with one extra carbon on the side chain.

(b) (iii) 90% of candidates correctly stated the observations. A few candidates did not realize that the Br₂ would react with the phenolic part of the molecule.