

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE O Level

MARK SCHEME for the May/June 2006 question paper

5070 CHEMISTRY

5070/03

Paper 3

maximum raw mark 40

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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1 16 marks

(a) titration [12]

4 marks for each of two titration results within 0.2 cm³ of the Supervisor's value.
3 marks for results within 0.3 cm³ etc.
no marks for results more than 0.5 cm³ from the supervisor's value

maximum of 3 marks for concordance, i.e. results within 0.2 cm³

1 mark for taking a correct average

(b) concentration of X [2]

method (1) answer (1)

(c) M_r of X [2]

method (1) answer (1)

2 24 marks

Solid R (manganese(IV) oxide)

| | | |
|--------|-------------------------------------------|-----|
| Test 1 | effervesces | [1] |
| | gas relights a glowing splint | [1] |
| | oxygen produced | [1] |
| | exothermic reaction | [1] |
| | solid is insoluble (or appears unchanged) | [1] |

| | | |
|--------|---------------------|-----|
| Test 2 | effervesces | [1] |
| | gas bleaches litmus | [1] |
| | chlorine produced | [1] |
| | brown solution | [1] |

Solution S (manganese(II) sulphate)

| | | |
|--------|--------------------------------------------------|-----|
| Test 3 | beige ppt/pale brown | [2] |
| | insoluble in excess | [1] |
| | darkens on the surface | [1] |
| | brown ppt | [1] |
| | effervesces | [1] |
| | gas relights a glowing splint or oxygen produced | [1] |

| | | |
|--------|-------------|-----|
| Test 4 | no reaction | [1] |
| | no reaction | [1] |

| | | |
|--------|-------------------|-----|
| Test 5 | white ppt | [1] |
| | insoluble in acid | [1] |

| | | |
|--------|-----------|-----|
| Test 6 | brown ppt | [1] |
|--------|-----------|-----|

| | | | |
|---------------|------------------------------------|-----------------|--------------|
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Conclusion

In Test 1 R is a catalyst [1]

In Test 2 R is an oxidising agent [1]

The anion is a sulphate [1]

Any 24 marks to score.