

40th INTERNATIONAL CHEMISTRY OLYMPIAD

UK Round One - 2008

MARKING SCHEME

Notes

Chemical equations may be given as sensible multiples of those given here.

State symbols do not need to be included in the chemical equations to obtain the mark(s).

Answers should be given to an appropriate number of significant figures although the marker should only penalise this once.

Total 62 marks.

Question 1		Answer	Marks
(a)		$\text{SiO}_2 + \text{C} \rightarrow \text{Si} + \text{CO}_2$ <i>(also accept $\text{SiO}_2 + 2\text{C} \rightarrow \text{Si} + 2\text{CO}$)</i>	1
(b)	i)	109 °	1
	ii)	$\text{SiHCl}_3 + \text{H}_2 \rightarrow \text{Si} + 3\text{HCl}$	1
(c)	i)	$4\text{SiH}(\text{OCH}_2\text{CH}_3)_3 \rightarrow \text{SiH}_4 + 3\text{Si}(\text{OCH}_2\text{CH}_3)_4$	1
	ii)	$\text{SiH}_4 + 2\text{O}_2 \rightarrow \text{SiO}_2 + 2\text{H}_2\text{O}$	1
(d)	i)	$C_x = 2.00 \times 10^{-3} \times 3300 (1 - 0.95)^{-0.998} = 131 \text{ ppm}$	2
	ii)	If k is small, $k - 1 \approx -1$ $\therefore 10 = 8.00 \times 10^{-6} \times 1300 (1 - x)^{-1}$ $1 - x = 0.00104$ 0.104% would have to be discarded	2

9 marks

Note: Tests are to be taken under controlled conditions. Students must not have access to the information contained in this marking scheme prior to, or during, the test.