

# 41st INTERNATIONAL CHEMISTRY OLYMPIAD

## UK Round One - 2009

### MARKING SCHEME

#### Notes

Chemical equations may be given as sensible multiples of those given here.  
Formulae can be given by any conventional method (i.e. structural or molecular).

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 64 marks.

Question 1		Answer	Marks
(a)	i)	It is aromatic / the bonds in the ring are conjugated / there are alternate single and double bonds in the ring / the electrons in the ring are delocalised / very similar to benzene	1
	ii)	3 peaks	1
	iii)	$C_2H_6N_8 + 7/2 O_2 \rightarrow 2 CO_2 + 3 H_2O + 4 N_2$ or $2 C_2H_6N_8 + 7 O_2 \rightarrow 4 CO_2 + 6 H_2O + 8 N_2$	1
(b)	i)	$19^\circ$ or $19.5^\circ$ or $19^\circ 28'$	1
	ii)	$C_8N_8O_{16} \rightarrow 8 CO_2 + 4 N_2$	1
(c)		$C_6H_7N_3O_{11} + 9/4 O_2 \rightarrow 6 CO_2 + 7/2 H_2O + 3/2 N_2$ or $4 C_6H_7N_3O_{11} + 9 O_2 \rightarrow 24 CO_2 + 14 H_2O + 6 N_2$	2

7 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.