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Supplement of

Interference from alkenes in chemiluminescent NO_x measurements

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Date	03/11/2010 AM	03/11/2010 PM	04/11/2010 AM	04/11/2010 PM	05/11/2010 AM	05/11/2010 PM	08/11/2010 AM	08/11/2010 PM	09/11/2010 AM	09/11/2010 PM	10/11/2010 (AM)	10/11/2010 (PM)	11/11/2010 (AM)	11/11/2010 (AM)	
Alkene (brackets refer to aliquot injection)	C2B	Terpinolene	TME	a-Terpinene (1-5)	T2B	Limonene	Ethene (1)	Isoprene (1-2)	T2B (1)	TME (1)	H2O (1)	H2O (1)	Methylchavicol (1-5)	H2O (1)	
				Myrcene (6)		CO (4)	Propene (2)	α -Pinene (3-4)			T2B (2-5)	Terpinolene (2-4)			
				Limonene (7)		TME (5)	Isobutene (3)	Myrcene (5-6)			CO (2-5)	CO (2-5)		TME (6-8)	α -terpinene (5-7)
				α -Pinene (8)			1-butene (4)	β -Pinene (7-8)							
Aliquot introduction to chamber (Mixing ratio, ppb)	1	20	20	20	20	20	50	100	100	50	50	20-30%	20-30%	20	20-30%
	2	20	20	20	20	20	50	100	100	500	500	20	50	20	20
	3	20	20	50	20	20	50	100	100	1000	1000	20	50	50	20
	4	50	40	50	50	50	100	100	100	5000	5000	50	50	50	50
	5	50	40	50	50	50	50		100	10000	10000	50	50	50	50
	6				100				100			20	50		50
	7				100				100			50	50		
	8				100				100			50			

33 **Table S1.** Mixing ratios of VOC introduced into the chamber

35

36 Kinetic Interference Potential (KIP)

37 Kinetic interference potentials were calculated using the reaction rate constants for the selected
38 alkenes with ozone. The calculated KIP (shown in Table 4 of the manuscript) are a percentage of a
39 given alkene's potential chemiluminescent signal which would not be subtracted in the standard
40 background cycle, under the assumption that the background cycle conditions (O_3 mixing ratio,
41 residence time) would be sufficient to remove 99% of the NO present.

42 For example, if 99% of NO reacts with excess O_3 in the reaction chamber then the pseudo first order
43 rate conditions are given by:

44

$$\frac{[NO]}{[NO]_0} = \exp(-k't) \quad \text{Eq. S1}$$

where $k' = k[O_3]t$ and $\frac{[NO]}{[NO]_0} = 0.01$ (i.e. 1% of NO left after reaction with excess O_3), then

$$\exp(-k't) = 0.01 \quad \text{Eq. S2}$$

$$k't = -\ln(0.01) \quad \text{Eq. S3}$$

where k is the rate constant for the reaction of NO with O_3 .

$$k't \times \frac{k_{(Alkene+O_3)}}{k_{(NO+O_3)}} = k_{(Alkene+O_3)}[O_3]t \quad \text{Eq. S4}$$

Substituting Eq. S3 into Eq. S4 and rearranging gives:

$$\exp(-k_{(Alkene+O_3)}[O_3]t) = \frac{[Alk]}{[Alk]_0} \quad \text{Eq. S5}$$

which gives the fraction of alkene left after the background cycle. The percentage of alkene contributing to the signal interference would therefore be given by:

$$100 \times \left(1 - \frac{[Alk]}{[Alk]_0}\right) \quad \text{Eq. S6}$$

45