Supplement of Atmos. Chem. Phys., 17, 12361–12378, 2017
https://doi.org/10.5194/acp-17-12361-2017-supplement

Atmospheric Chemistry and Physics
Open Access
EGU

Supplement of

Fast heterogeneous N_2O_5 uptake and $ClNO_2$ production in power plant and industrial plumes observed in the nocturnal residual layer over the North China Plain

Zhe Wang et al.

Correspondence to: Zhe Wang (z.wang@polyu.edu.hk) and Tao Wang (cetwang@polyu.edu.hk)

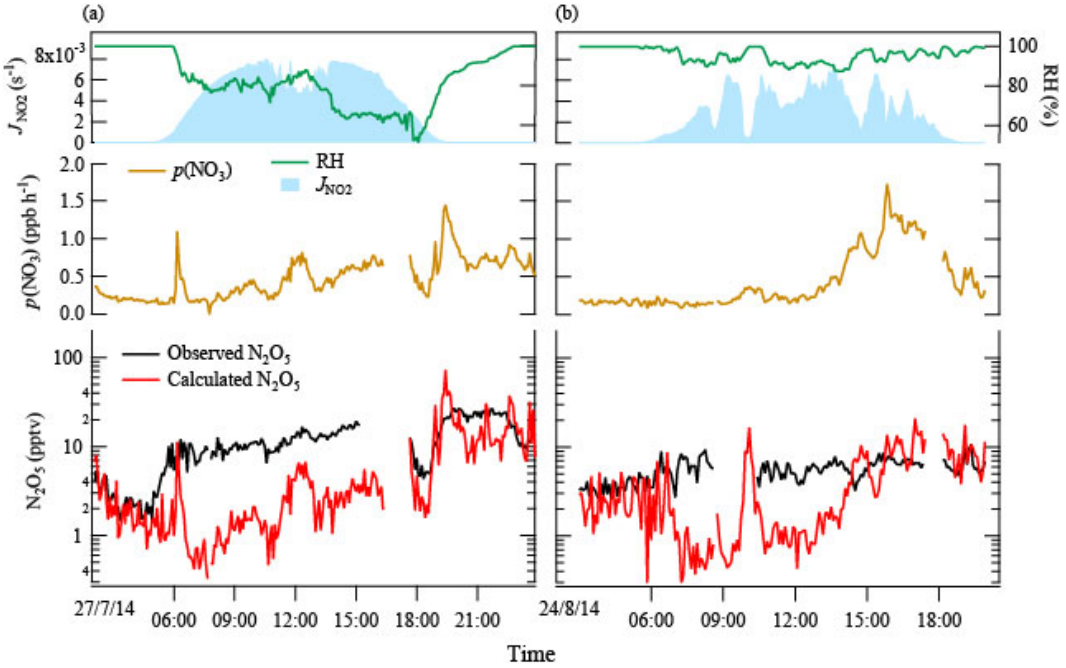

Figure S1: Observed and steady-state calculated daytime N_2O_5, nitrate radical production rate and meteorological parameters for the case of (a) 27 July and (b) 24 August, 2014.

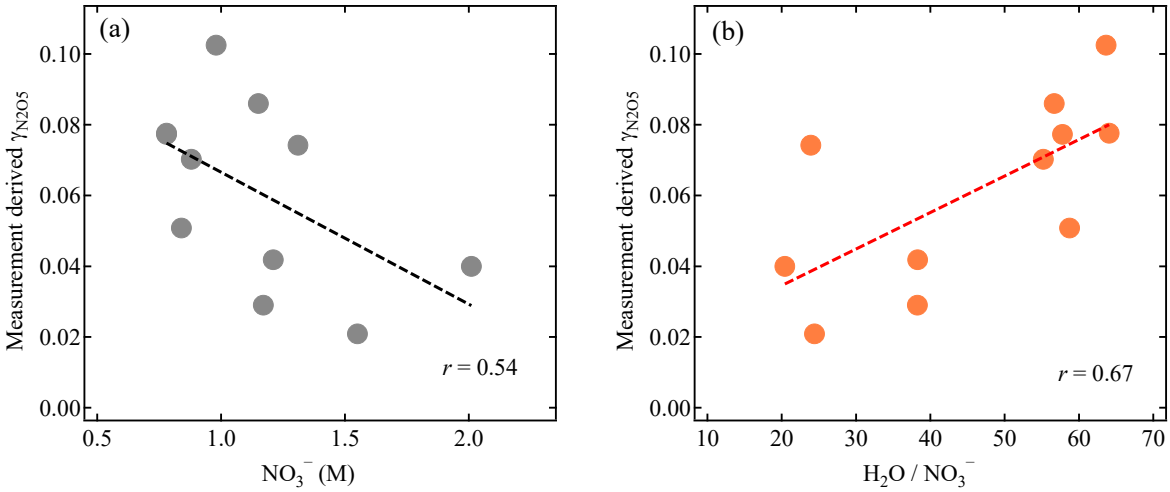

Figure S2: Relationship between derived γ_{N2O5} from the measurements with (a) the molar concentration of aerosol nitrate and (b) the molar ratio of aerosol water to nitrate during the study period.

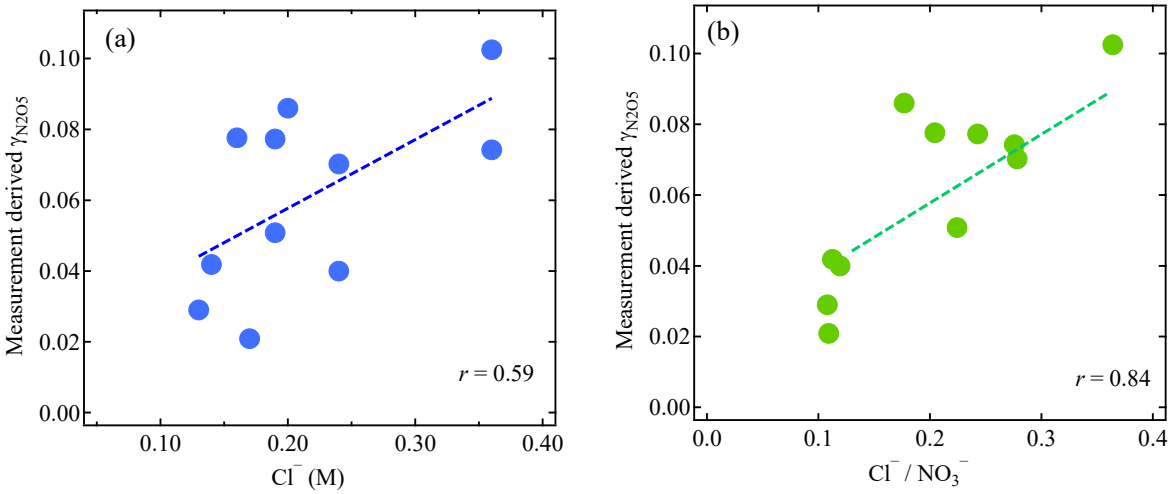

Figure S3: Relationship between derived γ_{N2O5} from the measurements with (a) the molar concentration of aerosol chloride and (b) the molar ratio of aerosol chloride to nitrate during the study period.

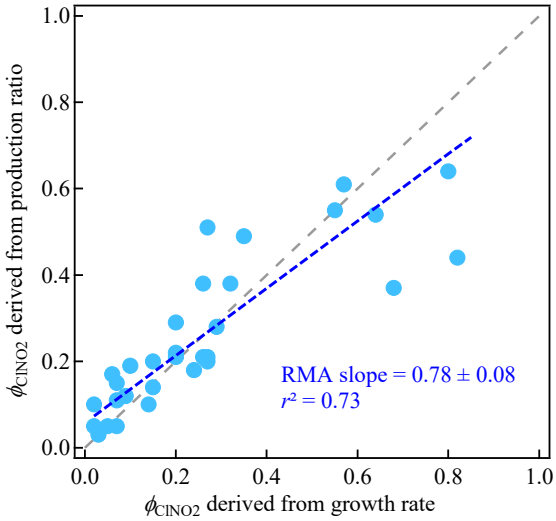

Figure S4: Comparison of estimated $ClNO_2$ yields from two different approaches: approach A using the ratio of the observed $ClNO_2$ growth rate to steady-state N_2O_5 loss rate based on Eq. 6; approach B using the production ratio of observed enhancements of $ClNO_2$ and total nitrate, $\phi = 2/(\Delta NO_3^-/\Delta ClNO_2 + 1)$ according to Riedel et al., 2013.

Table S1: Mean mixing ratios of VOC species measured in the early morning before sunrise and in the evening during the previous campaign at Mt. Tai in 2007. Bimolecular rate coefficients for VOCs-NO_3 reactions were determined following Brown et al. (2011) and Atkinson and Arey (2003).

Species	Mean mixing ratio (pptv)		Species	Mean mixing ratio (pptv)	
	Early morning	Evening		Early morning	Evening
Alkanes			**Aromatics**		
Ethane	3372	3340	Benzene	1238	981
Propane	1331	1340	Toluene	1872	2775
i-Butane	343	411	Ethylbenzene	168	194
n-Butane	453	591	m,p-Xylene	289	417
i-Pentane	1223	1385	o-Xylene	104	143
n-Pentane	209	384	i-Propylbenzene	14	22
2-Methylpentane	1135	2095	n-Propylbenzene	30	47
3-Methylpentane	908	1598	2-Ethyltoluene, 3-Ethyltoluene, 4-Ethyltoluene	127	218
n-Hexane	923	1558	1,3,5-Trimethylbenzene	39	59
n-Heptane	60	147	1,2,4-Trimethylbenzene	73	167
n-Octane	32	53	1,2,3-Trimethylbenzene	24	60
1,3-Butadiene	6	26	**Biogenic**		
2,2-Dimethylbutane	113	147	Isoprene	37	53
2,3-dimethylbutane	178	215	α-pinene	43	51
2-Methylhexane	279	471	β-pinene	4.8	5
3-Methylhexane	228	459	DMS	44	33
Cyclohexane (B)	68	127			
Alkenes			**Others**		
Ethene	1733	1401	OCS	610	593
Propene	127	195	Ethyne	2637	2081
1-Butene	29	80			
i-Butene	94	164			
cis-2-Butene	23	53			
trans-2-Butene	17	60			
1-Pentene	18	70			
trans-2-Pentene	40	44			
cis-2-Pentene	33	60			
2-Methyl-1-butene	38	51			
2-Methyl-2-butene	29	36			