Supplement of

Identification of highly oxygenated organic molecules and their role in aerosol formation in the reaction of limonene with nitrate radical

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In the supplement we describe the determination of the calibration coefficient of HOM, the estimation of SOA growth based on HOM condensation. In addition, more figures, tables and schemes are provided.

S1 Determination of the calibration coefficient

A calibration coefficient was determined and used to convert peak intensity in CIMS to concentrations. The calibration coefficient of H₂SO₄ can be applied to HOM because the ionization efficiency of HOM and H₂SO₄ are close (Ehn et al., 2014; Pullinen et al., 2020). The concentration of H₂SO₄ is given by:

$$[\text{H}_2\text{SO}_4] = C \times I \quad (\text{Eq. S1})$$

where C is the calibration coefficient of H₂SO₄, I is the normalized count (nc, the peak area of an ion divided by total ion signal of mass spectrum) of peak intensity. The detailed description of derivation of calibration coefficient for H₂SO₄ in SAPHIR chamber can be found elsewhere (Ehn et al., 2014; Pullinen et al., 2020; Zhao et al., 2021). In brief, H₂SO₄ was produced in the chamber by OH•-initiated oxidation of SO₂. OH• were mainly generated from photolysis of HONO. Concentrations of SO₂ and OH• were measured by laser induced fluorescence (LIF) (Fuchs et al., 2012) and an SO₂ analyzer (Thermo System 43i). The concentration of H₂SO₄ is given by:

$$d[H_2SO_4]/dt = k[SO_2][OH\bullet] - (k_{wall} + k_{dil})[H_2SO_4] \quad (\text{Eq. S2})$$

where [H₂SO₄], [SO₂], and [OH•] are concentrations, k is the rate constant of the reaction of SO₂ with OH•, k_{wall} is the wall loss rate (6×10⁻⁴ s⁻¹) (Zhao et al., 2018), and k_{dil} is the dilution rate (1.5×10⁻⁵ s⁻¹).

C was determined to be 2.5×10¹⁰ molecules·cm⁻³·nc⁻¹ for H₂SO₄. The uncertainty of C is -52 %/+101 % from the uncertainty of SO₂ concentration (~7 %), OH• concentration (~10 %), I (~10 %) and k (Δlogk = ±0.3) using error propagation (Zhao et al., 2021).

A relative transmission efficiency curve of the ¹⁵NO₃⁻-CIMS was measured with perfluoropentanoic acid (C₄F₉COOH) in our previous study (Pullinen et al., 2020). A monotonous decrease of the transmission function from 100 % to 86 % was determined within an m/z range of 62-791 Th. Thus, the uncertainty of the mass-independent transmission efficiency used when applying the calibration coefficient of H₂SO₄ to HOM is determined to be -0 %/+14 %.

S2 HOM condensation on SOA

Estimation of HOM condensation on SOA was based on measurement of HOM concentration and particle surface concentration, and the assumption that all HOM colliding with the surface of particles led to a net uptake. Collision rate of a gas phase HOM species with particles of all size is given by:

$$K = \gamma \frac{\pi}{4} (d_p + d_v)^2 (\bar{c}_p^2 + \bar{c}_v^2)^{\frac{1}{2}} \cdot C_v \quad (\text{Eq. S3})$$

where d_p and d_v are the diameters of the particle and molecule, and $\bar{c}_p$ and $\bar{c}_v$ are the average thermal speeds of the particle and the HOM species, respectively. C_v represents measured HOM molecule concentration. The coefficient γ is given by:

$$\gamma = \frac{4}{3} Kn \beta_m \quad (\text{Eq. S4})$$

where Kn is the Knudsen number and β_m is the correction factor in the transition regime according to the Fuchs-Sutugin approach (Seinfeld and Pandis, 2006). Then, particle growth rate as represented in mass concentration (GR_m) can be described as:

$$\begin{aligned} GR_m &= \frac{dM}{dt} = \rho_p \frac{dV_p}{dt} = \rho_p K \frac{m_v}{\rho_v} = \frac{\pi}{4} \gamma \frac{\rho_p}{\rho_v} (d_p + d_v)^2 (\bar{c}_p^2 + \bar{c}_v^2)^{\frac{1}{2}} \cdot m_v C_v \\ &= \frac{\pi}{4} \gamma \frac{\rho_p}{\rho_v} (d_p + d_v)^2 \left(\frac{8kT}{\pi} \right)^{\frac{1}{2}} \left(\frac{1}{m_p} + \frac{1}{m_v} \right)^{\frac{1}{2}} \cdot m_v C_v \end{aligned} \quad (\text{Eq. S5})$$

where M is the particle mass concentration ($\mu\text{g}/\text{m}^3$), t is time, V_p is the particle volume, T is temperature, m_p and m_v are the exact mass of particle and vapour, respectively. Omitting the $\frac{1}{m_p}$ term (much smaller than $\frac{1}{m_v}$) (Ehn et al., 2014) and the d_v term (small compared to d_p) in Eq. 4, one can get

$$GR_m = \frac{1}{4} \gamma \frac{\rho_p}{\rho_v} S_p \left(\frac{8kT}{\pi m_v} \right)^{\frac{1}{2}} \cdot m_v C_v \quad (\text{Eq. S6})$$

where S_p is the particle surface concentration measured by SMPS. The calculation of γ using Eq. S4 was taken from previous studies (Lehtinen and Kulmala, 2003; Seinfeld and Pandis, 2006). Multiplying the calculated particle mass growth rate by time interval gives the particle growth in each time interval.

The wall loss and dilution loss rates of the particles are obtained from a later period of the experiment when particle mass ceased to grow and the change in particle mass was only due to the wall loss and dilution. During this period the loss rate of the total particle mass concentration (TM) was obtained through linear fit of $\ln(\text{TM})$ to t when:

$$\ln(TM_{t_n}) = \ln(TM_{t_0}) - (k_{\text{wall}} + k_{\text{dil}})(t_n - t_0) \quad (\text{Eq. S7})$$

Herein $\ln(\text{TM})$ decreased linearly over time at constant geometric mean of the particle diameter, which suggests no noticeable evaporation loss. The wall loss was independently determined from the particle number concentration, which showed values consistent with method using mass concentration. The value of particle wall loss rate in this experiment k_{wall} was determined to be $3.6 \times 10^{-5} \text{ s}^{-1}$.

S3 Supplement figures, reaction schemes, and tables

Figures S1 - S13

Figure S1. Contribution of NO_3 and O_3 oxidation pathways of limonene to chemical loss of limonene presented as fractions during the experiment. Black vertical lines indicate time for six limonene additions into the chamber.

Figure S2. $\text{RO}_2^\bullet$ loss rate based on bimolecular reactions with $\text{RO}_2^\bullet$, NO_3 , NO_2 , NO and $\text{HO}_2^\bullet$ (color bars) during the first limonene addition period (P1). Blue rectangle denotes the first 10 min of the reaction time (P1a), which is the time period used for peak fitting.

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104 Figure S3. Time series of peak intensity of the $C_{10}H_{16}NO_x\bullet$ family during the whole experimental
 105 period. The vertical black, red and blue lines represent the time of limonene, NO_2 and O_3 additions,
 106 respectively.

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109 Figure S4. Time series of peak intensity of two representatives of the $C_{10}H_{14}O_x$ family during the
 110 whole experimental period. The vertical black, red and blue lines represent the time of limonene,
 111 NO_2 and O_3 additions, respectively.

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Figure S5. Time series of peak intensity of the $C_9H_{15}NO_x$ family during the whole experimental period. The vertical black, red and blue lines represent the time of limonene, NO_2 and O_3 additions, respectively.

Figure S6. Time series of peak intensity of the $C_8H_{11}NO_x$ family during the whole experimental period. The vertical black, red and blue lines represent the time of limonene, NO_2 and O_3 additions, respectively.

Figure S7. Time series of peak intensity of the $C_7H_9NO_x$ family during the whole experimental period. The vertical black, red and blue lines represent the time of limonene, NO_2 and O_3 additions, respectively.

Figure S8. Kendrick mass defect plot (O atom-based) of major dimer products. The area of the circles is proportional to the average intensity of each compound during the P1a period. The color denotes O/C ratio. Dashed lines indicate major product families that were identified.

Figure S9. Time series of peak intensity of the $C_{20}H_{31}NO_x$ family during the whole experimental period. The vertical black, red and blue lines represent the time of limonene, NO_2 and O_3 additions, respectively.

Figure S10. Time series of peak intensity of the $C_{20}H_{33}N_3O_x$ family during the whole experimental period. The vertical black, red and blue lines represent the time of limonene, NO_2 and O_3 additions, respectively.

Figure S11. Time series of peak intensity of the $C_{20}H_{34}N_4O_x$ family during the whole experimental period. The vertical black, red and blue lines represent the time of limonene, NO_2 and O_3 additions, respectively.

Figure S12. Kendrick mass defect plot (O-atom-based) of trimers. The area of the circles is proportional to the average intensity of each compound during the P1a period. The color denotes O/C ratio. Dashed lines indicate major product families that were identified.

Figure S13. HOM concentration over time in the first limonene addition period. The HOM concentration underwent a period of rapid increase (first-production phase), followed by an intermediate phase where it remained constant and a second phase of increase afterwards (second-production phase). In the first-production phase, primary HOM production contributed most to the HOM increase, while in the intermediate phase and the second-production phase, wall loss and secondary HOM production increased in importance.

Reaction schemes S1 to S3

Scheme S1. The possible formation pathways towards the production of 1N- C_{10} HOM RO_2 radicals ($\text{C}_{10}\text{H}_{16}\text{NO}_x\cdot$) and stable products $\text{C}_{10}\text{H}_{15}\text{NO}_x$ initiated by O_3 oxidation of limonene (Mentel et al., 2015).

Scheme S2. Possible formation pathways of C₁₀ monomers without nitrogen atoms.

Scheme S3. Example scheme for C₉H₁₃NO_x and C₉H₁₅NO_x formation from limonene; the depicted reactions may not be the dominant pathways.

Tables S1 - S3

Table S1. Peak list from limonene + NO₃ experiment.

m/z	Detected ion formula	Parent molecule formula
268.0077	C ₆ H ₇ NO ₇ [¹⁵ N]O ₃ ⁻	C ₆ H ₇ NO ₇
284.0026	C ₆ H ₇ NO ₈ [¹⁵ N]O ₃ ⁻	C ₆ H ₇ NO ₈
284.9866	C ₆ H ₆ O ₉ [¹⁵ N]O ₃ ⁻	C ₆ H ₆ O ₉
302.0131	C ₆ H ₉ NO ₉ [¹⁵ N]O ₃ ⁻	C ₆ H ₉ NO ₉
312.9927	C ₆ H ₆ N ₂ O ₉ [¹⁵ N]O ₃ ⁻	C ₆ H ₆ N ₂ O ₉
333.0189	C ₆ H ₁₀ N ₂ O ₁₀ [¹⁵ N]O ₃ ⁻	C ₆ H ₁₀ N ₂ O ₁₀
280.0077	C ₇ H ₇ NO ₇ [¹⁵ N]O ₃ ⁻	C ₇ H ₇ NO ₇
282.0233	C ₇ H ₉ NO ₇ [¹⁵ N]O ₃ ⁻	C ₇ H ₉ NO ₇
283.0073	C ₇ H ₈ O ₈ [¹⁵ N]O ₃ ⁻	C ₇ H ₈ O ₈

284.0390	$\text{C}_7\text{H}_{11}\text{NO}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_{11}\text{NO}_7$
297.0104	$\text{C}_7\text{H}_8\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_8\text{NO}_8$
311.0135	$\text{C}_7\text{H}_8\text{N}_2\text{O}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_8\text{N}_2\text{O}_8$
314.0131	$\text{C}_7\text{H}_9\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_9\text{NO}_9$
315.0210	$\text{C}_7\text{H}_{10}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_{10}\text{NO}_9$
316.0288	$\text{C}_7\text{H}_{11}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_{11}\text{NO}_9$
330.0080	$\text{C}_7\text{H}_9\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_9\text{NO}_{10}$
332.0237	$\text{C}_7\text{H}_{11}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_{11}\text{NO}_{10}$
343.0033	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{10}$
346.0030	$\text{C}_7\text{H}_9\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_9\text{NO}_{11}$
347.0108	$\text{C}_7\text{H}_{10}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_{10}\text{NO}_{11}$
358.9982	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{11}$
374.9931	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{12}$
390.9880	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{13}$
406.9830	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_8\text{N}_2\text{O}_{14}$
408.9986	$\text{C}_7\text{H}_{10}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_7\text{H}_{10}\text{N}_2\text{O}_{14}$
280.0440	$\text{C}_8\text{H}_{11}\text{NO}_6[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_6$
283.0437	$\text{C}_8\text{H}_{12}\text{O}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{12}\text{O}_7$
296.0390	$\text{C}_8\text{H}_{11}\text{NO}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_7$
297.0468	$\text{C}_8\text{H}_{12}\text{NO}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{12}\text{NO}_7$
312.0339	$\text{C}_8\text{H}_{11}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_8$
313.0417	$\text{C}_8\text{H}_{12}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{12}\text{NO}_8$
314.0495	$\text{C}_8\text{H}_{13}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{13}\text{NO}_8$
316.0652	$\text{C}_8\text{H}_{15}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{15}\text{NO}_8$
325.0291	$\text{C}_8\text{H}_{10}\text{N}_2\text{O}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{10}\text{N}_2\text{O}_8$
328.0288	$\text{C}_8\text{H}_{11}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_9$
329.0366	$\text{C}_8\text{H}_{12}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{12}\text{NO}_9$
330.0444	$\text{C}_8\text{H}_{13}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{13}\text{NO}_9$
344.0237	$\text{C}_8\text{H}_{11}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_{10}$
345.0315	$\text{C}_8\text{H}_{12}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{12}\text{NO}_{10}$
346.0393	$\text{C}_8\text{H}_{13}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{13}\text{NO}_{10}$
360.0186	$\text{C}_8\text{H}_{11}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_{11}$
361.0264	$\text{C}_8\text{H}_{12}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{12}\text{NO}_{11}$
376.0135	$\text{C}_8\text{H}_{11}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_{12}$
377.0214	$\text{C}_8\text{H}_{12}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{12}\text{NO}_{12}$
392.0084	$\text{C}_8\text{H}_{11}\text{NO}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{11}\text{NO}_{13}$
420.9986	$\text{C}_8\text{H}_{10}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_8\text{H}_{10}\text{N}_2\text{O}_{14}$
297.0832	$\text{C}_9\text{H}_{16}\text{NO}_6[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{16}\text{NO}_6$
311.0624	$\text{C}_9\text{H}_{14}\text{NO}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_7$
312.0703	$\text{C}_9\text{H}_{15}\text{NO}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{15}\text{NO}_7$
324.0577	$\text{C}_9\text{H}_{13}\text{N}_2\text{O}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{N}_2\text{O}_7$
326.0495	$\text{C}_9\text{H}_{13}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{NO}_8$
327.0573	$\text{C}_9\text{H}_{14}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_8$

328.0652	$\text{C}_9\text{H}_{15}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{15}\text{NO}_8$
329.0730	$\text{C}_9\text{H}_{16}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{16}\text{NO}_8$
342.0444	$\text{C}_9\text{H}_{13}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{NO}_9$
343.0523	$\text{C}_9\text{H}_{14}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_9$
344.0601	$\text{C}_9\text{H}_{15}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{15}\text{NO}_9$
358.0393	$\text{C}_9\text{H}_{13}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{NO}_{10}$
359.0472	$\text{C}_9\text{H}_{14}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_{10}$
360.0550	$\text{C}_9\text{H}_{15}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{15}\text{NO}_{10}$
370.0268	$\text{C}_9\text{H}_{11}\text{N}_2\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{11}\text{N}_2\text{O}_{10}$
371.0346	$\text{C}_9\text{H}_{12}\text{N}_2\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{12}\text{N}_2\text{O}_{10}$
374.0343	$\text{C}_9\text{H}_{13}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{NO}_{11}$
375.0421	$\text{C}_9\text{H}_{14}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_{11}$
376.0499	$\text{C}_9\text{H}_{15}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{15}\text{NO}_{11}$
390.0292	$\text{C}_9\text{H}_{13}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{NO}_{12}$
391.0370	$\text{C}_9\text{H}_{14}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_{12}$
392.0448	$\text{C}_9\text{H}_{15}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{15}\text{NO}_{12}$
403.0244	$\text{C}_9\text{H}_{12}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{12}\text{N}_2\text{O}_{12}$
405.0401	$\text{C}_9\text{H}_{14}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{N}_2\text{O}_{12}$
406.0241	$\text{C}_9\text{H}_{13}\text{NO}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{NO}_{13}$
407.0319	$\text{C}_9\text{H}_{14}\text{NO}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_{13}$
408.0397	$\text{C}_9\text{H}_{15}\text{NO}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{15}\text{NO}_{13}$
422.0190	$\text{C}_9\text{H}_{13}\text{NO}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{13}\text{NO}_{14}$
423.0268	$\text{C}_9\text{H}_{14}\text{NO}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_9\text{H}_{14}\text{NO}_{14}$
309.0594	$\text{C}_{10}\text{H}_{14}\text{O}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{O}_7$
309.0832	$\text{C}_{10}\text{H}_{16}\text{NO}_6[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_6$
311.0750	$\text{C}_{10}\text{H}_{16}\text{O}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{O}_7$
324.0703	$\text{C}_{10}\text{H}_{15}\text{NO}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{NO}_7$
325.0543	$\text{C}_{10}\text{H}_{14}\text{O}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{O}_8$
325.0781	$\text{C}_{10}\text{H}_{16}\text{NO}_7[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_7$
327.0699	$\text{C}_{10}\text{H}_{16}\text{O}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{O}_8$
340.0652	$\text{C}_{10}\text{H}_{15}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{NO}_8$
341.0492	$\text{C}_{10}\text{H}_{14}\text{O}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{O}_9$
341.0730	$\text{C}_{10}\text{H}_{16}\text{NO}_8[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_8$
342.0570	$\text{C}_{10}\text{H}_{15}\text{O}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{O}_9$
343.0648	$\text{C}_{10}\text{H}_{16}\text{O}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{O}_9$
356.0601	$\text{C}_{10}\text{H}_{15}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{NO}_9$
357.0441	$\text{C}_{10}\text{H}_{14}\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{O}_{10}$
357.0679	$\text{C}_{10}\text{H}_{16}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_9$
358.0519	$\text{C}_{10}\text{H}_{15}\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{O}_{10}$
358.0757	$\text{C}_{10}\text{H}_{17}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{NO}_9$
359.0597	$\text{C}_{10}\text{H}_{16}\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{O}_{10}$
371.0710	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_9$
372.0550	$\text{C}_{10}\text{H}_{15}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{NO}_{10}$

373.0390	$\text{C}_{10}\text{H}_{14}\text{O}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{O}_{11}$
373.0628	$\text{C}_{10}\text{H}_{16}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_{10}$
374.0468	$\text{C}_{10}\text{H}_{15}\text{O}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{O}_{11}$
374.0706	$\text{C}_{10}\text{H}_{17}\text{NO}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{NO}_{10}$
375.0547	$\text{C}_{10}\text{H}_{16}\text{O}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{O}_{11}$
385.0502	$\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_{10}$
386.0581	$\text{C}_{10}\text{H}_{15}\text{N}_2\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{N}_2\text{O}_{10}$
387.0659	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{10}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{10}$
388.0499	$\text{C}_{10}\text{H}_{15}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{NO}_{11}$
389.0339	$\text{C}_{10}\text{H}_{14}\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{O}_{12}$
389.0577	$\text{C}_{10}\text{H}_{16}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_{11}$
390.0418	$\text{C}_{10}\text{H}_{15}\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{O}_{12}$
390.0656	$\text{C}_{10}\text{H}_{17}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{NO}_{11}$
391.0734	$\text{C}_{10}\text{H}_{18}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{18}\text{NO}_{11}$
402.0530	$\text{C}_{10}\text{H}_{15}\text{N}_2\text{O}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{N}_2\text{O}_{11}$
403.0608	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{11}$
404.0448	$\text{C}_{10}\text{H}_{15}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{NO}_{12}$
405.0527	$\text{C}_{10}\text{H}_{16}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_{12}$
406.0605	$\text{C}_{10}\text{H}_{17}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{NO}_{12}$
417.0401	$\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_{12}$
418.0479	$\text{C}_{10}\text{H}_{15}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{N}_2\text{O}_{12}$
420.0397	$\text{C}_{10}\text{H}_{15}\text{NO}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{15}\text{NO}_{13}$
420.0636	$\text{C}_{10}\text{H}_{17}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{N}_2\text{O}_{12}$
422.0554	$\text{C}_{10}\text{H}_{17}\text{NO}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{NO}_{13}$
433.0350	$\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_{13}$
434.0666	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{12}$
435.0506	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{13}$
437.0425	$\text{C}_{10}\text{H}_{16}\text{NO}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{NO}_{14}$
437.0663	$\text{C}_{10}\text{H}_{18}\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{18}\text{N}_2\text{O}_{13}$
438.0503	$\text{C}_{10}\text{H}_{17}\text{NO}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{NO}_{14}$
451.0456	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{14}$
453.0612	$\text{C}_{10}\text{H}_{18}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{18}\text{N}_2\text{O}_{14}$
466.0565	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{14}$
467.0405	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_{15}$
482.0514	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{15}$
498.0463	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{10}\text{H}_{17}\text{N}_3\text{O}_{16}$
453.1618	$\text{C}_{17}\text{H}_{28}\text{NO}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{17}\text{H}_{28}\text{NO}_9$
467.1649	$\text{C}_{17}\text{H}_{28}\text{N}_2\text{O}_9[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{17}\text{H}_{28}\text{N}_2\text{O}_9$
500.1387	$\text{C}_{17}\text{H}_{27}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{17}\text{H}_{27}\text{NO}_{12}$
513.1340	$\text{C}_{17}\text{H}_{26}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{17}\text{H}_{26}\text{N}_2\text{O}_{12}$
531.1445	$\text{C}_{17}\text{H}_{28}\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{17}\text{H}_{28}\text{N}_2\text{O}_{13}$
545.1238	$\text{C}_{17}\text{H}_{26}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{17}\text{H}_{26}\text{N}_2\text{O}_{14}$
548.1235	$\text{C}_{17}\text{H}_{27}\text{NO}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{17}\text{H}_{27}\text{NO}_{15}$

449.1907	$C_{18}H_{30}N_2O_7[^{15}N]O_3^-$	$C_{18}H_{30}N_2O_7$
480.1489	$C_{18}H_{27}NO_{10}[^{15}N]O_3^-$	$C_{18}H_{27}NO_{10}$
511.1547	$C_{18}H_{28}N_2O_{11}[^{15}N]O_3^-$	$C_{18}H_{28}N_2O_{11}$
527.1496	$C_{18}H_{28}N_2O_{12}[^{15}N]O_3^-$	$C_{18}H_{28}N_2O_{12}$
529.1415	$C_{18}H_{28}NO_{13}[^{15}N]O_3^-$	$C_{18}H_{28}NO_{13}$
558.1554	$C_{18}H_{29}N_3O_{13}[^{15}N]O_3^-$	$C_{18}H_{29}N_3O_{13}$
562.1391	$C_{18}H_{29}NO_{15}[^{15}N]O_3^-$	$C_{18}H_{29}NO_{15}$
574.1504	$C_{18}H_{29}N_3O_{14}[^{15}N]O_3^-$	$C_{18}H_{29}N_3O_{14}$
494.1645	$C_{19}H_{29}NO_{10}[^{15}N]O_3^-$	$C_{19}H_{29}NO_{10}$
496.1802	$C_{19}H_{31}NO_{10}[^{15}N]O_3^-$	$C_{19}H_{31}NO_{10}$
509.1754	$C_{19}H_{30}N_2O_{10}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{10}$
510.1595	$C_{19}H_{29}NO_{11}[^{15}N]O_3^-$	$C_{19}H_{29}NO_{11}$
512.1751	$C_{19}H_{31}NO_{11}[^{15}N]O_3^-$	$C_{19}H_{31}NO_{11}$
525.1704	$C_{19}H_{30}N_2O_{11}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{11}$
526.1544	$C_{19}H_{29}NO_{12}[^{15}N]O_3^-$	$C_{19}H_{29}NO_{12}$
528.1700	$C_{19}H_{31}NO_{12}[^{15}N]O_3^-$	$C_{19}H_{31}NO_{12}$
541.1653	$C_{19}H_{30}N_2O_{12}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{12}$
542.1493	$C_{19}H_{29}NO_{13}[^{15}N]O_3^-$	$C_{19}H_{29}NO_{13}$
544.1649	$C_{19}H_{31}NO_{13}[^{15}N]O_3^-$	$C_{19}H_{31}NO_{13}$
557.1602	$C_{19}H_{30}N_2O_{13}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{13}$
560.1599	$C_{19}H_{31}NO_{14}[^{15}N]O_3^-$	$C_{19}H_{31}NO_{14}$
573.1551	$C_{19}H_{30}N_2O_{14}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{14}$
575.1708	$C_{19}H_{32}N_2O_{14}[^{15}N]O_3^-$	$C_{19}H_{32}N_2O_{14}$
576.1548	$C_{19}H_{31}NO_{15}[^{15}N]O_3^-$	$C_{19}H_{31}NO_{15}$
577.1388	$C_{19}H_{30}O_{16}[^{15}N]O_3^-$	$C_{19}H_{30}O_{16}$
585.1663	$C_{19}H_{30}N_4O_{13}[^{15}N]O_3^-$	$C_{19}H_{30}N_4O_{13}$
589.1500	$C_{19}H_{30}N_2O_{15}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{15}$
604.1609	$C_{19}H_{31}N_3O_{15}[^{15}N]O_3^-$	$C_{19}H_{31}N_3O_{15}$
605.1449	$C_{19}H_{30}N_2O_{16}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{16}$
607.1368	$C_{19}H_{30}NO_{17}[^{15}N]O_3^-$	$C_{19}H_{30}NO_{17}$
617.1562	$C_{19}H_{30}N_4O_{15}[^{15}N]O_3^-$	$C_{19}H_{30}N_4O_{15}$
620.1558	$C_{19}H_{31}N_3O_{16}[^{15}N]O_3^-$	$C_{19}H_{31}N_3O_{16}$
621.1398	$C_{19}H_{30}N_2O_{17}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{17}$
636.1507	$C_{19}H_{31}N_3O_{17}[^{15}N]O_3^-$	$C_{19}H_{31}N_3O_{17}$
637.1348	$C_{19}H_{30}N_2O_{18}[^{15}N]O_3^-$	$C_{19}H_{30}N_2O_{18}$
652.1457	$C_{19}H_{31}N_3O_{18}[^{15}N]O_3^-$	$C_{19}H_{31}N_3O_{18}$
664.1569	$C_{19}H_{31}N_5O_{17}[^{15}N]O_3^-$	$C_{19}H_{31}N_5O_{17}$
668.1406	$C_{19}H_{31}N_3O_{19}[^{15}N]O_3^-$	$C_{19}H_{31}N_3O_{19}$
680.1518	$C_{19}H_{31}N_5O_{18}[^{15}N]O_3^-$	$C_{19}H_{31}N_5O_{18}$
696.1467	$C_{19}H_{31}N_5O_{19}[^{15}N]O_3^-$	$C_{19}H_{31}N_5O_{19}$
507.1962	$C_{20}H_{32}N_2O_9[^{15}N]O_3^-$	$C_{20}H_{32}N_2O_9$
508.1802	$C_{20}H_{31}NO_{10}[^{15}N]O_3^-$	$C_{20}H_{31}NO_{10}$
523.1911	$C_{20}H_{32}N_2O_{10}[^{15}N]O_3^-$	$C_{20}H_{32}N_2O_{10}$

524.1751	$\text{C}_{20}\text{H}_{31}\text{NO}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{NO}_{11}$
539.1860	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{11}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{11}$
540.1700	$\text{C}_{20}\text{H}_{31}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{NO}_{12}$
542.1857	$\text{C}_{20}\text{H}_{33}\text{NO}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{NO}_{12}$
543.1697	$\text{C}_{20}\text{H}_{32}\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{O}_{13}$
553.1653	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{12}$
555.1809	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{12}$
556.1649	$\text{C}_{20}\text{H}_{31}\text{NO}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{NO}_{13}$
557.1490	$\text{C}_{20}\text{H}_{30}\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{30}\text{O}_{14}$
559.1646	$\text{C}_{20}\text{H}_{32}\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{O}_{14}$
569.1602	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{13}$
570.1680	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{13}$
570.1918	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{12}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{12}$
571.1758	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{13}$
572.1599	$\text{C}_{20}\text{H}_{31}\text{NO}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{NO}_{14}$
575.1595	$\text{C}_{20}\text{H}_{32}\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{O}_{15}$
585.1551	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{14}$
586.1629	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{14}$
586.1867	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{13}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{13}$
587.1708	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{14}$
588.1548	$\text{C}_{20}\text{H}_{31}\text{NO}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{NO}_{15}$
590.1704	$\text{C}_{20}\text{H}_{33}\text{NO}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{NO}_{15}$
591.1544	$\text{C}_{20}\text{H}_{32}\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{O}_{16}$
600.1660	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{14}$
601.1500	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{15}$
602.1578	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{15}$
602.1817	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{14}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{14}$
603.1657	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{15}$
606.1653	$\text{C}_{20}\text{H}_{33}\text{NO}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{NO}_{16}$
616.1609	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{15}$
617.1449	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{16}$
618.1528	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_2\text{O}_{16}$
618.1766	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{15}$
619.1606	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{16}$
632.1558	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{16}$
633.1398	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{30}\text{N}_2\text{O}_{17}$
633.1637	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{16}$
633.1875	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{15}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{15}$
634.1715	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{16}$
635.1555	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{17}$
648.1507	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{17}$
649.1586	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{17}$
649.1824	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{16}$

650.1664	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{17}$
651.1504	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{18}$
664.1457	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{18}$
665.1535	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{18}$
665.1773	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{17}$
666.1613	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{18}$
667.1453	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{19}$
680.1406	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{19}$
681.1484	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_3\text{O}_{19}$
681.1722	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{18}$
682.1562	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{19}$
683.1402	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{32}\text{N}_2\text{O}_{20}$
696.1355	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{31}\text{N}_3\text{O}_{20}$
697.1671	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{19}$
698.1511	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{33}\text{N}_3\text{O}_{20}$
713.1620	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{20}\text{H}_{34}\text{N}_4\text{O}_{20}$
784.2607	$\text{C}_{26}\text{H}_{47}\text{N}_3\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{26}\text{H}_{47}\text{N}_3\text{O}_{20}$
892.2414	$\text{C}_{26}\text{H}_{47}\text{N}_5\text{O}_{25}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{26}\text{H}_{47}\text{N}_5\text{O}_{25}$
771.2668	$\text{C}_{27}\text{H}_{44}\text{N}_6\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{27}\text{H}_{44}\text{N}_6\text{O}_{16}$
727.2545	$\text{C}_{28}\text{H}_{44}\text{N}_2\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{28}\text{H}_{44}\text{N}_2\text{O}_{16}$
744.2334	$\text{C}_{28}\text{H}_{43}\text{NO}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{28}\text{H}_{43}\text{NO}_{18}$
770.2715	$\text{C}_{28}\text{H}_{45}\text{N}_5\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{28}\text{H}_{45}\text{N}_5\text{O}_{16}$
786.2664	$\text{C}_{28}\text{H}_{45}\text{N}_5\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{28}\text{H}_{45}\text{N}_5\text{O}_{17}$
864.2254	$\text{C}_{28}\text{H}_{43}\text{N}_5\text{O}_{22}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{28}\text{H}_{43}\text{N}_5\text{O}_{22}$
803.2818	$\text{C}_{29}\text{H}_{48}\text{N}_4\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{48}\text{N}_4\text{O}_{18}$
804.2658	$\text{C}_{29}\text{H}_{47}\text{N}_3\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{47}\text{N}_3\text{O}_{19}$
817.2610	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{19}$
818.2450	$\text{C}_{29}\text{H}_{45}\text{N}_3\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{45}\text{N}_3\text{O}_{20}$
833.2559	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{20}$
835.2240	$\text{C}_{29}\text{H}_{44}\text{N}_2\text{O}_{22}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{44}\text{N}_2\text{O}_{22}$
836.2556	$\text{C}_{29}\text{H}_{47}\text{N}_3\text{O}_{21}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{47}\text{N}_3\text{O}_{21}$
865.2458	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{22}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{22}$
881.2407	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{23}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{23}$
897.2356	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{24}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{29}\text{H}_{46}\text{N}_4\text{O}_{24}$
772.2647	$\text{C}_{30}\text{H}_{47}\text{NO}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{47}\text{NO}_{18}$
783.2919	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{16}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{16}$
787.2756	$\text{C}_{30}\text{H}_{48}\text{N}_2\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_2\text{O}_{18}$
788.2596	$\text{C}_{30}\text{H}_{47}\text{NO}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{47}\text{NO}_{19}$
799.2868	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{17}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{17}$
800.2709	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{18}$
802.2865	$\text{C}_{30}\text{H}_{49}\text{N}_3\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{49}\text{N}_3\text{O}_{18}$
815.2818	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{18}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{18}$
816.2658	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{19}$

831.2767	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{19}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{19}$
834.2763	$\text{C}_{30}\text{H}_{49}\text{N}_3\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{49}\text{N}_3\text{O}_{20}$
847.2716	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{20}$
848.2556	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{21}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{21}$
849.2396	$\text{C}_{30}\text{H}_{46}\text{N}_2\text{O}_{22}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{46}\text{N}_2\text{O}_{22}$
862.2825	$\text{C}_{30}\text{H}_{49}\text{N}_5\text{O}_{20}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{49}\text{N}_5\text{O}_{20}$
863.2665	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{21}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{21}$
866.2662	$\text{C}_{30}\text{H}_{49}\text{N}_3\text{O}_{22}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{49}\text{N}_3\text{O}_{22}$
867.2502	$\text{C}_{30}\text{H}_{48}\text{N}_2\text{O}_{23}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_2\text{O}_{23}$
879.2614	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{22}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{22}$
880.2454	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{23}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{23}$
895.2563	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{23}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{23}$
896.2404	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{24}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{47}\text{N}_3\text{O}_{24}$
911.2513	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{24}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{48}\text{N}_4\text{O}_{24}$
926.2621	$\text{C}_{30}\text{H}_{49}\text{N}_5\text{O}_{24}[^{15}\text{N}]\text{O}_3^-$	$\text{C}_{30}\text{H}_{49}\text{N}_5\text{O}_{24}$

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179 Table S2. Observed $C_9H_{14}NO_x^\bullet$ radicals (m) and their termination products, including carbonyl
 180 compounds (m-17), hydroxyl compounds (m-15), and hydroperoxy compounds (m+1). Their
 181 concentrations during P1a period are normalized to that of $C_9H_{15}NO_8$, which had the highest
 182 concentration among the family series of 1N- C_9 monomers. Their relative intensities during the P1a
 183 period are shown on the second line in each cell.

Peroxy radical	Carbonyl	Hydroxy	Hydroperoxy
m	m-17	m-15	m+1
$C_9H_{14}NO_7^\bullet$			$C_9H_{15}NO_7$
18.8 %			19.3 %
$C_9H_{14}NO_8^\bullet$		$C_9H_{15}NO_7$	$C_9H_{15}NO_8$
27.9 %		19.3 %	100.0 %
$C_9H_{14}NO_9^\bullet$	$C_9H_{13}NO_8$	$C_9H_{15}NO_8$	$C_9H_{15}NO_9$
20.7 %	98.6 %	100.0 %	66.2 %
$C_9H_{14}NO_{10}^\bullet$	$C_9H_{13}NO_9$	$C_9H_{15}NO_9$	$C_9H_{15}NO_{10}$
46.2 %	56.9 %	66.2 %	30.9 %
$C_9H_{14}NO_{11}^\bullet$	$C_9H_{13}NO_{10}$	$C_9H_{15}NO_{10}$	$C_9H_{15}NO_{11}$
12.4 %	38.3 %	30.9 %	3.6 %
$C_9H_{14}NO_{12}^\bullet$	$C_9H_{13}NO_{11}$	$C_9H_{15}NO_{11}$	$C_9H_{15}NO_{12}$
12.2 %	14.5 %	3.6 %	23.9 %
$C_9H_{14}NO_{13}^\bullet$	$C_9H_{13}NO_{12}$	$C_9H_{15}NO_{12}$	$C_9H_{15}NO_{13}$
9.7 %	13.9 %	23.9 %	10.4 %
$C_9H_{14}NO_{14}^\bullet$	$C_9H_{13}NO_{13}$	$C_9H_{15}NO_{13}$	
20.1 %	10.0 %	10.4 %	
	$C_9H_{13}NO_{14}$		
	8.9 %		

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187 Table S3. Reaction rate constants (code named in the MCM) of every individual RO₂• bimolecular188 reaction used for estimating RO₂• fate according to MCM.

RO ₂ • species	Rate constant with the reactant below (cm ³ ·molecule ⁻¹ ·s ⁻¹)				
	HO ₂ •	NO	NO ₃ •	RO ₂ •	NO ₂
C732CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C622CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
MACRO2	KRO2HO2*0.625	KRO2NO	KRO2NO3	9.20E-14	
NC826O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	9.20E-14	
MMALANHYO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
NORLIMO2	KRO2HO2*0.890	KRO2NO	KRO2NO3	9.20E-14	
C312COCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
NLMKAO2	KRO2HO2*0.914	KRO2NO*0.760	KRO2NO3	9.20E-14	
C629O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	9.20E-14	
C624CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C622O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	1.30E-12	
C537O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	
NLIMALO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	9.20E-14	
C531O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	2.00E-12	
LMKAO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	9.20E-14	
C533O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	
C816O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	2.50E-13	
C517CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C626O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	1.30E-12	
C535O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
C731CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C626CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HMVKBO2	KRO2HO2*0.625	KRO2NO	KRO2NO3	8.80E-13	
C31CO3	KAPHO2	KAPNO	KRO2NO3*1.6	1.00E-11	KFPAN
C3MCOBDCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
IECCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C732O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	1.30E-12	
INCO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	2.90E-12	
HPC52CO3	KAPHO2	KAPNO	KRO2NO3*1.6	1.00E-11	KFPAN
INCNCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C519CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C823CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C735O2	KRO2HO2*0.820	KRO2NO	KRO2NO3	9.20E-14	
MMALNACO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HCOCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HCOCH2O2	KRO2HO2*0.387	KRO2NO	KRO2NO3	2.00E-12	

C923CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
CONM2CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C518CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C822CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HOCH2CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
CHOC3COCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C926O2	KRO2HO2*0.890	KRO2NO	KRO2NO3	9.20E-14	
C511CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C924O2	KRO2HO2*0.890	KRO2NO	KRO2NO3	8.80E-13	
C47CO3	KAPHO2	KAPNO	KRO2NO3*1.6	1.00E-11	KFPAN
C520O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
C733O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	8.80E-12	
LMKBO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	8.80E-13	
MEKAO2	KRO2HO2*0.625	KRO2NO	KRO2NO3	2.00E-12	
C731O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	1.30E-12	
INDHPCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
CO23C4CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C823O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	1.30E-12	
C730O2	KRO2HO2*0.820	KRO2NO	KRO2NO3	9.20E-14	
C734O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	8.80E-12	
C527O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	
CH3COCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C57O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
C824O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	8.80E-12	
NC623O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	8.80E-13	
HOCH2CH2O2	1.53D- 13*EXP(1300/TEMP) MP)	KRO2NO	KRO2NO3	2*(KCH3O2*7.8D- 14*EXP(1000/TEMP))@0.5	
INDO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	
CH3CO3	KAPHO2	7.5D- 12*EXP(290/TEMP)	4.00E-12	1.00E-11	KFPAN
CH3COCH2O2	1.36D- 13*EXP(1250/TEMP) MP)	kRO2NO	kRO2NO3	2*(K298CH3O2*8. 0D-12)@0.5	
MACROHO2	KRO2HO2*0.625	KRO2NO	KRO2NO3	1.40E-12	
COHM2CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C821O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	8.80E-13	
C58NO3CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C57NO3CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN

ISOPCO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	2.00E-12	
MACRNCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C925O2	KRO2HO2*0.890	KRO2NO	KRO2NO3	9.20E-14	
C923O2	KRO2HO2*0.890	KRO2NO	KRO2NO3	1.32E-12	
C817CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HC4CCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
LIMAO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	9.20E-14	
HC4ACO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C816CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C822O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	1.30E-12	
C820O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	9.20E-14	
INB1NBCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C826O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	9.20E-14	
LIMALBO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	8.80E-13	
C57AO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	
LIMCO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	9.20E-14	
C817O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	1.30E-12	
NLIMO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	9.20E-14	
NC728O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	9.20E-14	
CHOC3COO2	KRO2HO2*0.625	KRO2NO	KRO2NO3	2.00E-12	
NC730O2	KRO2HO2*0.820	KRO2NO	KRO2NO3	9.20E-14	
C728O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	9.20E-14	
LIMALO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	9.20E-14	
C4M2ALOH02	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
MACRNBCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HCOCH2CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C727O2	KRO2HO2*0.820	KRO2NO	KRO2NO3	8.80E-13	
C58O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
C729CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
MC3CODBCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HPC52O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
HMVKBCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
ISOPDO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	2.90E-12	
C624O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	2.50E-13	
C727CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
INDHCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
BIACETO2	KRO2HO2*0.625	KRO2NO	KRO2NO3	2.00E-12	
CISOPCO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	2.00E-12	
LMLKAO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	8.80E-13	
CO2H3CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
LIMBO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	8.80E-13	

CH3O2	3.8D- 13*EXP(780/TE MP)*(1- 1/(1+498*EXP(- 1160/TEMP)))	2.3D- 12*EXP(360/TEMP)	1.2E-12	2*KCH3O2*RO2*7 .18*EXP(- 885/TEMP) 2*KCH3O2*RO2*(1-7.18*EXP(- 885/TEMP))	KMT13
LIMALAO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	8.80E-13	
C825O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	8.80E-12	
CO2N3CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
MACO3	KAPHO2	8.70D- 12*EXP(290/TEMP)	KRO2NO3*1.74	1.00E-11	KFPAN
INBINACO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C58AO2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	
C59O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
CHOMOHCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C729O2	KRO2HO2*0.820	KRO2NO	KRO2NO3	1.30E-12	
CO25C6CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
CO2C3CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
HO1CO3C4O2	KRO2HO2*0.625	KRO2NO	KRO2NO3	2.00E-12	
MMALNBCO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
CHOCOCH2O2	KRO2HO2*0.520	KRO2NO	KRO2NO3	2.00E-12	
HOC2H4CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C628O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	9.20E-14	
C623O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	8.00E-13	
C625O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	9.20E-14	
LMLKBO2	KRO2HO2*0.914	KRO2NO	KRO2NO3	8.80E-13	
C627O2	KRO2HO2*0.770	KRO2NO	KRO2NO3	2.50E-12	
C517O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	1.30E-12	
C3MDIALO2	KRO2HO2*0.625	KRO2NO	KRO2NO3	9.20E-14	
C819O2	KRO2HO2	KRO2NO	KRO2NO3	9.20E-14	
CO2C4CO3	KAPHO2	KAPNO	KRO2NO3*1.74	1.00E-11	KFPAN
C534O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	9.20E-14	
C818O2	KRO2HO2*0.859	KRO2NO	KRO2NO3	1.30E-12	
C511O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	
C519O2	KRO2HO2*0.706	KRO2NO	KRO2NO3	8.80E-13	

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