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Supplement of

Biomass burning emission disturbances of
isoprene oxidation in a tropical forest

Fernando Santos et al.

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S1. Interpolation grid used in the Figures 3 and 5.

Figure 1. Interpolation grid (0 - 2000m and 11 - 18h)
S2. The kinetic rate constant measurements for $\text{OH} + \text{ISOPOOH}$ (1,2- and 4,3- ISOPOOH), at 297 K, is $7.5 \times 10^{-11}$ cm$^3$ molecule$^{-1}$ s$^{-1}$ for (1,2)-ISOPOOH and $1.18 \times 10^{-10}$ cm$^3$ molecule$^{-1}$ s$^{-1}$ for (4,3)-ISOPOOH (St Clair et al., 2015). The kinetic rate constant of $\text{MVK} + \text{OH} = 1.88 \times 10^{-11}$ cm$^3$ molecule$^{-1}$ s$^{-1}$ and $\text{MACR} + \text{OH} = 3.35 \times 10^{-11}$ cm$^3$ molecule$^{-1}$ s$^{-1}$ (Apel, 2002).

Average kinetic rate constant = $6.1325 \times 10^{-11}$

$K_{\text{iso}} - K_{\text{prod}} = (1.1 \times 10^{-10}) - (6.1325 \times 10^{-11}) = 4.8675 \times 10^{-11}$
Figure 2. Observations of the ratio $\Delta O_3/\Delta CO$ as a function of plume age in tropical and subtropical sites.
Simulated convective velocity and planetary boundary layer from WRF-Chem in the Forest Management Station ZF-2 (02° 36’S and 60° 12’W), 60 km north of Manaus (Dasa Gu, personal communication, June 2015).

Table 1. Convective velocity and planetary boundary layer used to calculate OH density following Karl et al. (2007) approach.

<table>
<thead>
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<th>Time interval (t)</th>
<th>Convective velocity (W)</th>
<th>PBL (Zi)</th>
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</tr>
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<tr>
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<tr>
<td>17-18</td>
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</table>
Figure 3. Schematic approaches used in OH calculation based on the sequential reaction model: (1) Column approach and (2) Plume approach, which considers vertical and horizontal transport for both biomass burning regimes and background environment.
Figure 4. Vertical profile for the ratio \[\frac{[\text{MVK} + \text{MACR} + \text{ISOPOOH}]}{[\text{Isoprene}]}, \text{NOx and Ozone mixing ratios during SAMBBA campaign: background (green), fresh smoke plume (red) and aged smoke plume (blue).} \]
Figure 5. Histogram that present the frequency distribution of CO [ppbv] for all SAMBBA flights in Amazon rainforest.
References

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