Supplement materials of

Reactive oxygen species (ROS) emissions and formation pathways in residential wood smoke under different combustion and aging conditions

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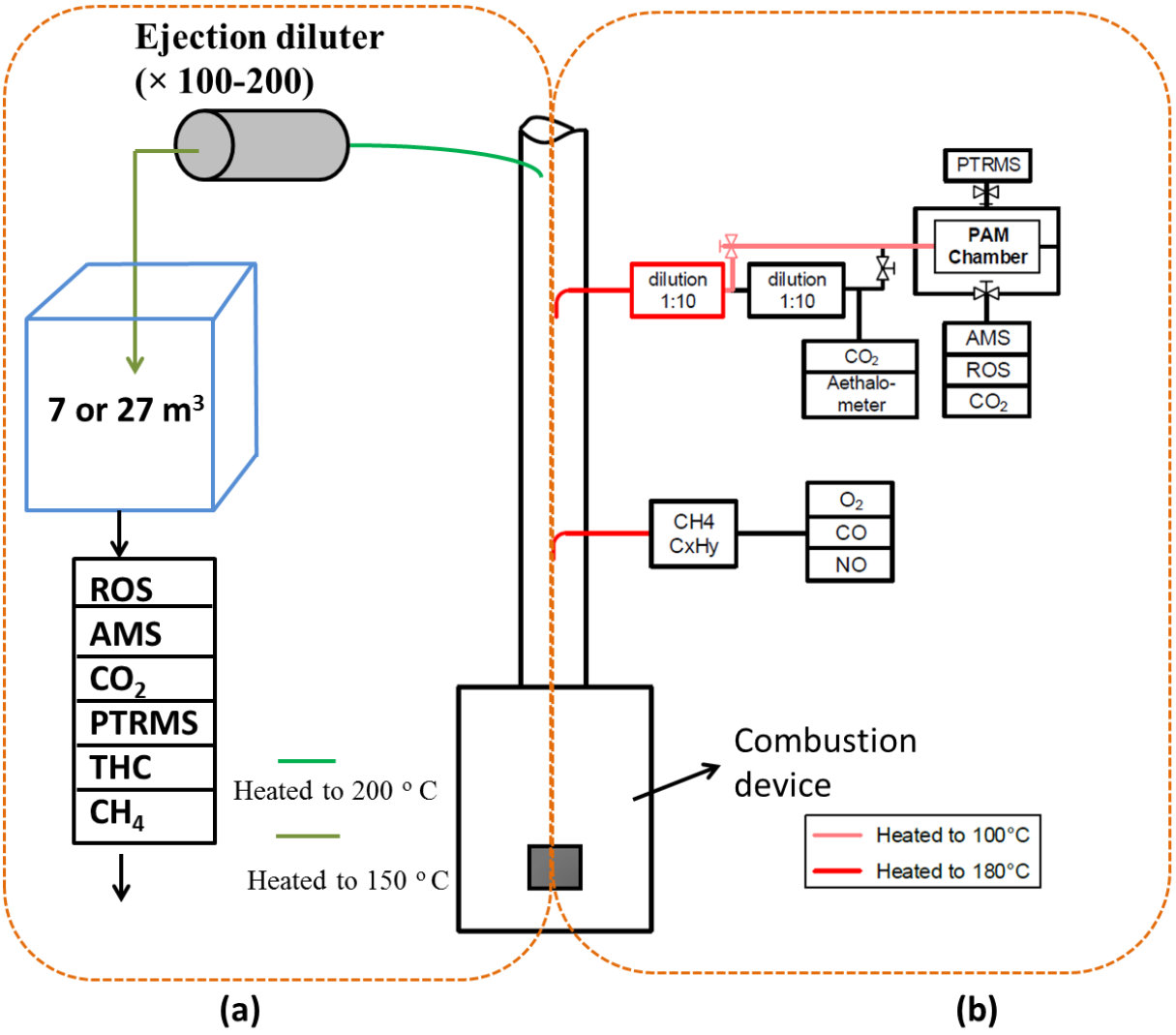
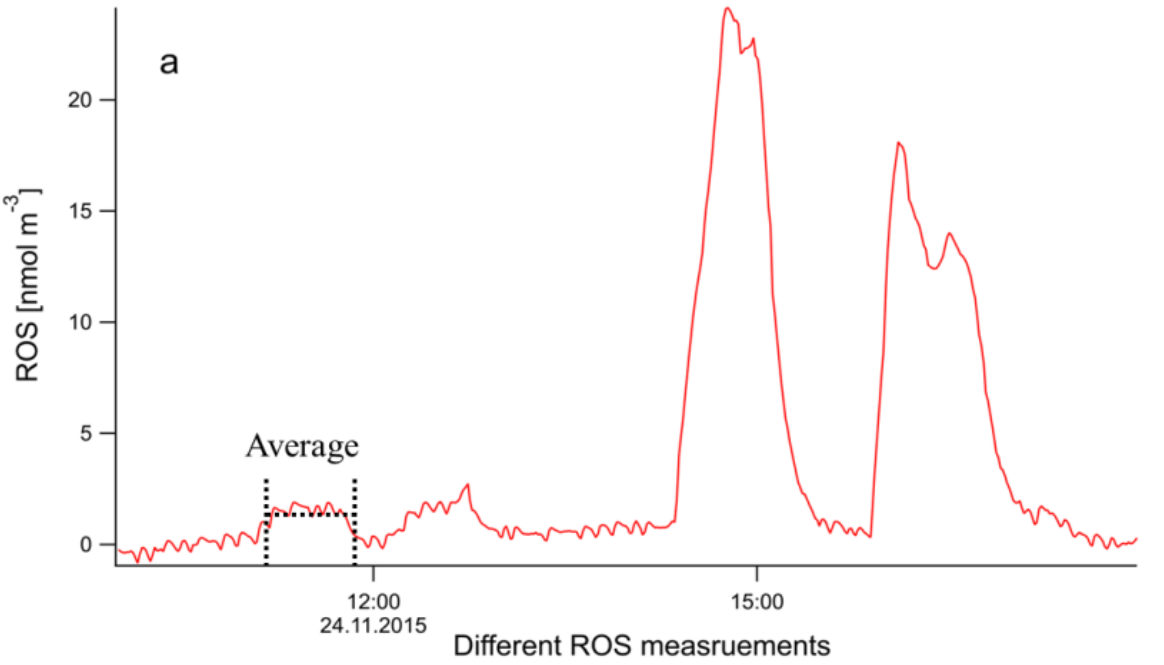
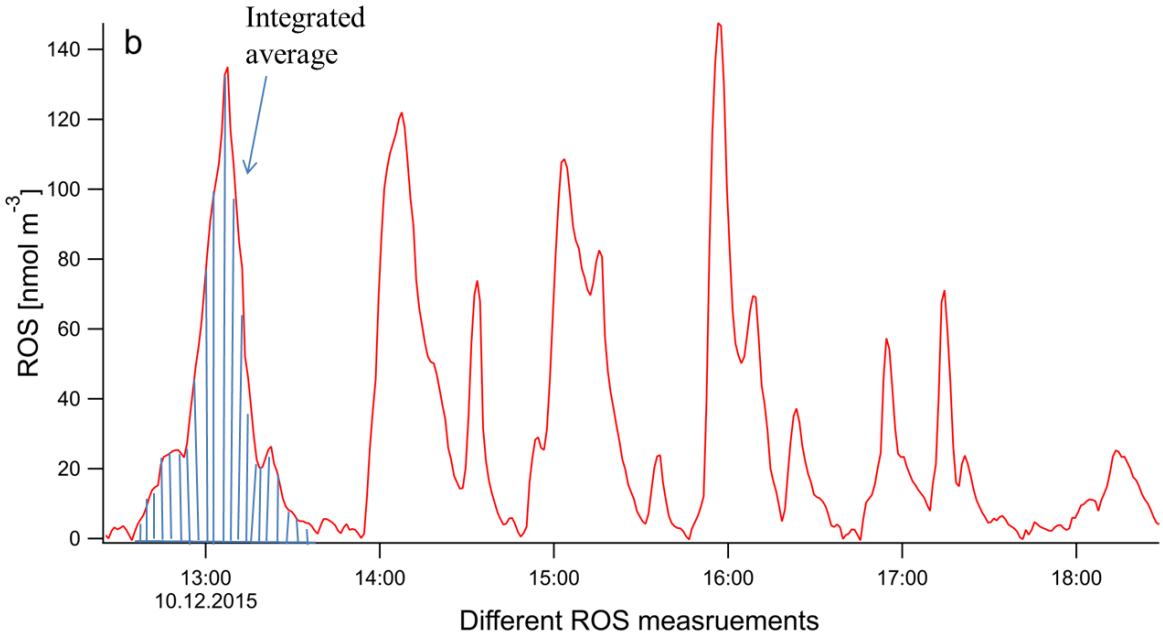


Figure S1. Schematic of wood combustion emissions aged by a) smog chamber (SC) and b) and potential aerosol mass (PAM) chamber.


a
ROS [nmol m-3]
20
15
10
5
0
Average
12:00
24.11.2015
15:00
Different ROS measruements


b
Integrated
average
ROS [nmol m-3]
140
120
100
80
60
40
20
0
13:00
10.12.2015
14:00
15:00
16:00
17:00
18:00
Different ROS measruements

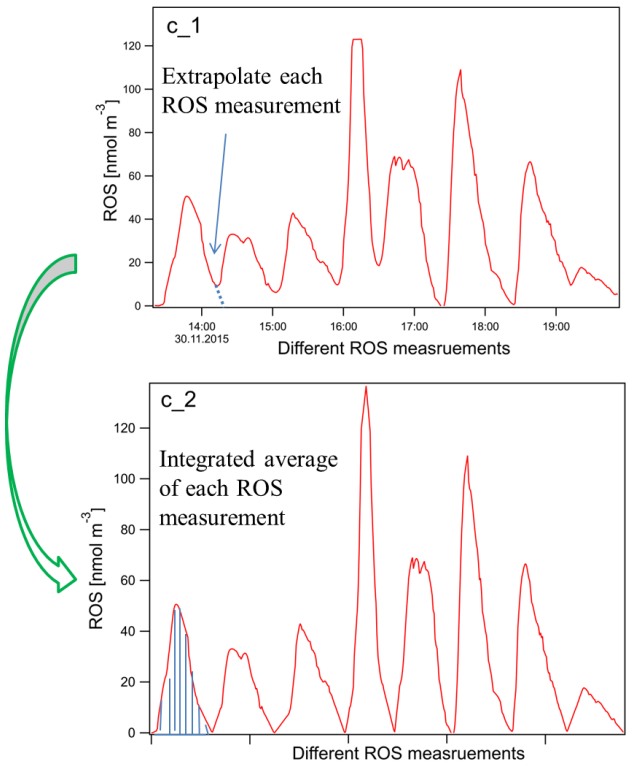


Figure S2 ROS content calculation methods during different combustion conditions, a) average b) integrated average c) extrapolated for the experiments with no background measurements (c_1) and the integrated average (c_2) of those experiments.

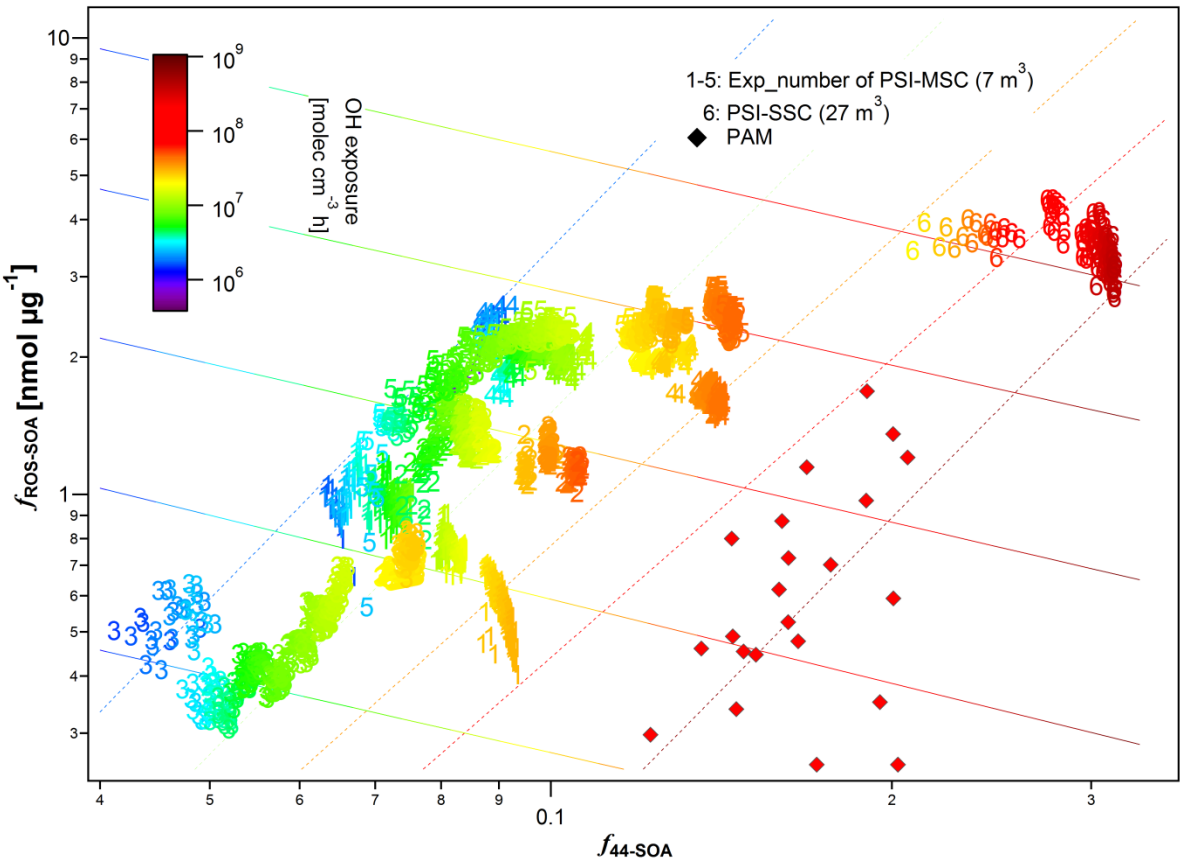


Figure S3: Variation of the fraction of ROS in SOA, $f_{ROS\text{-}SOA}$, with the fraction of *m/z*44 in the secondary organic aerosol measured by the AMS ($f_{44\text{-}SOA}$, x-axis) and the OH exposure estimated from the decay of d9-butanol measured by the PTR-ToF-MS (color code). Data are collected from two different smog chambers (SC) and from the PAM chamber. Dashed lines are isopleths of constant OH exposures, while solid lines are obtained by isolating the effect of OH exposure from the other variables. Numbers 1-5 represent the sequence of the five 7-m^3 SC experiments, Number 6 represents a single 27-m^3 SC experiment.

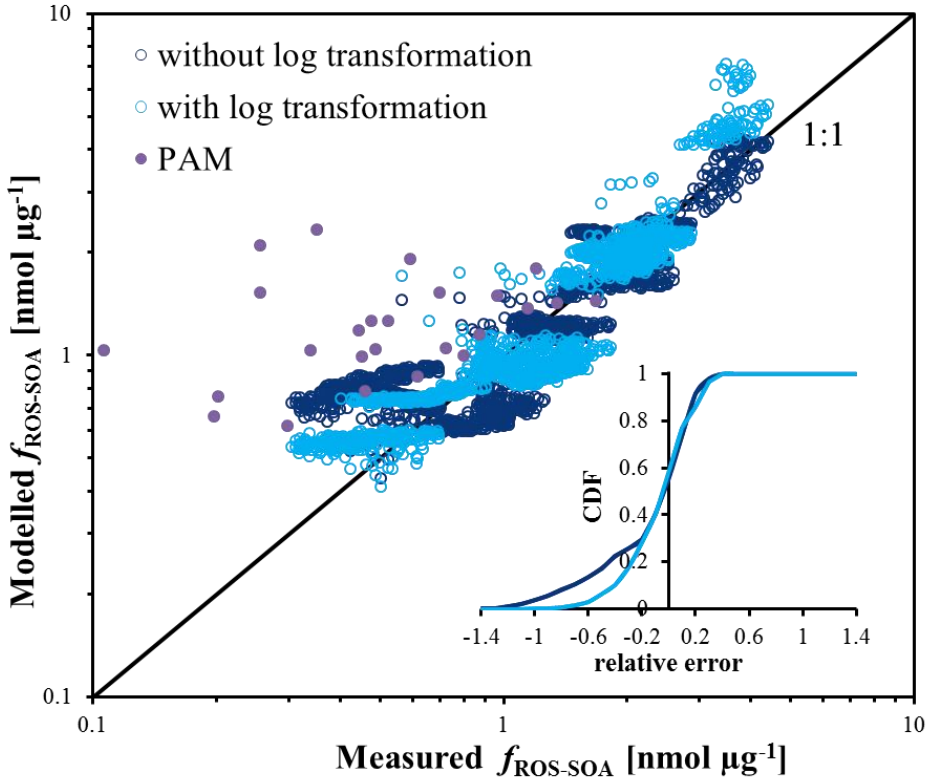


Figure S4: Comparison of the performance of two multiple regression models, with and without log-transformation of the data. The $f_{ROS-SOA}$ measured in the PAM is predicted using the same parameterization and results are displayed for comparison. The inset shows the cumulative density function (CDF) of the relative model residuals (measurements-model).

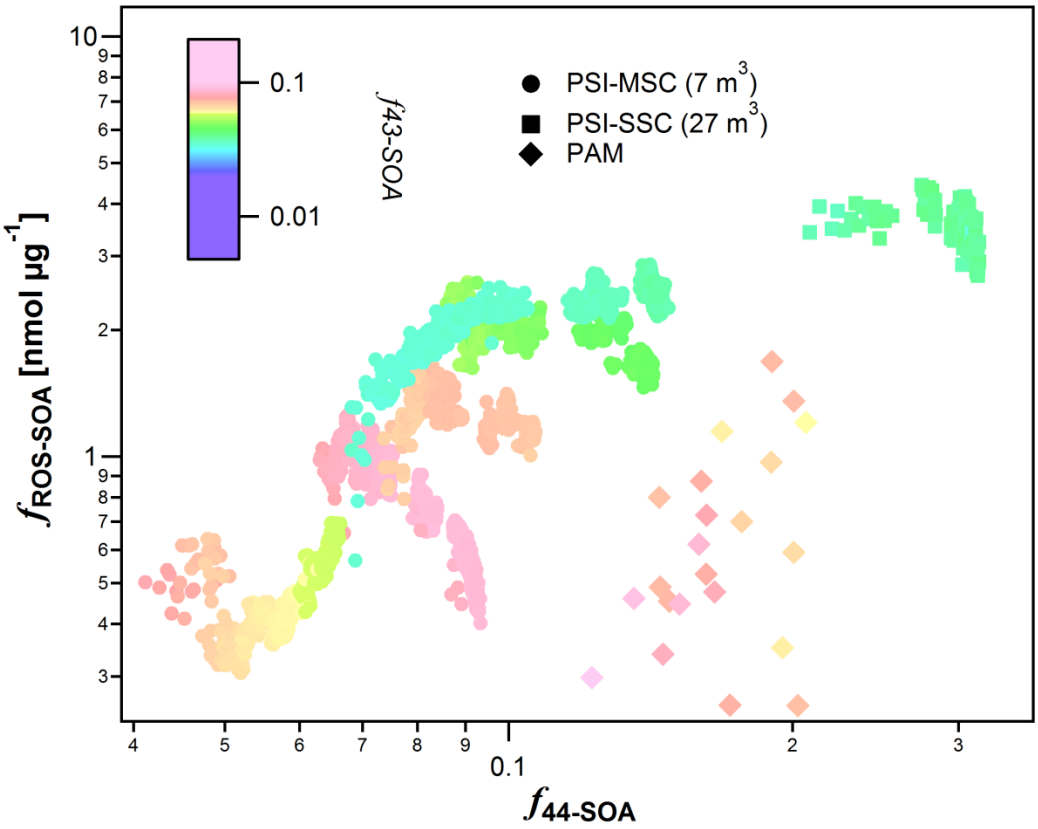


Figure S5: Variation of the fraction of ROS in SOA, $f_{ROS\text{-}SOA}$, with the fractions of *m/z* 44 and *m/z* 43 in the secondary organic aerosol measured by the AMS ($f_{44\text{-}SOA}$, x-axis and $f_{43\text{-}SOA}$ color code).