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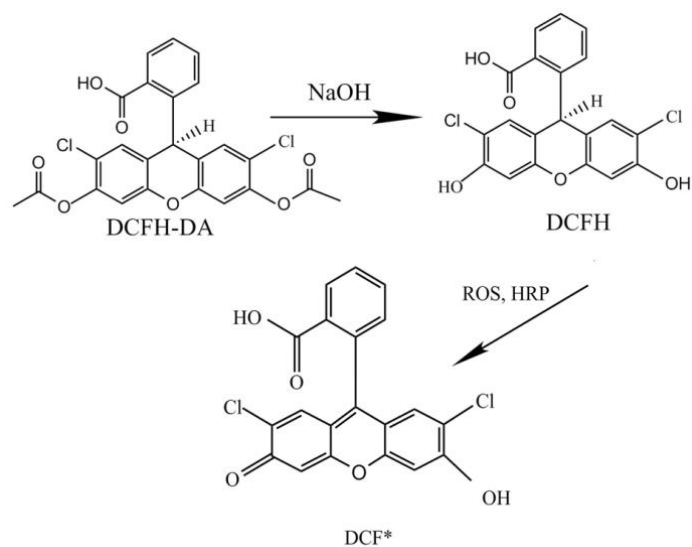
*Supplement of*

## **Development, characterization and first deployment of an improved on-line reactive oxygen species analyzer**

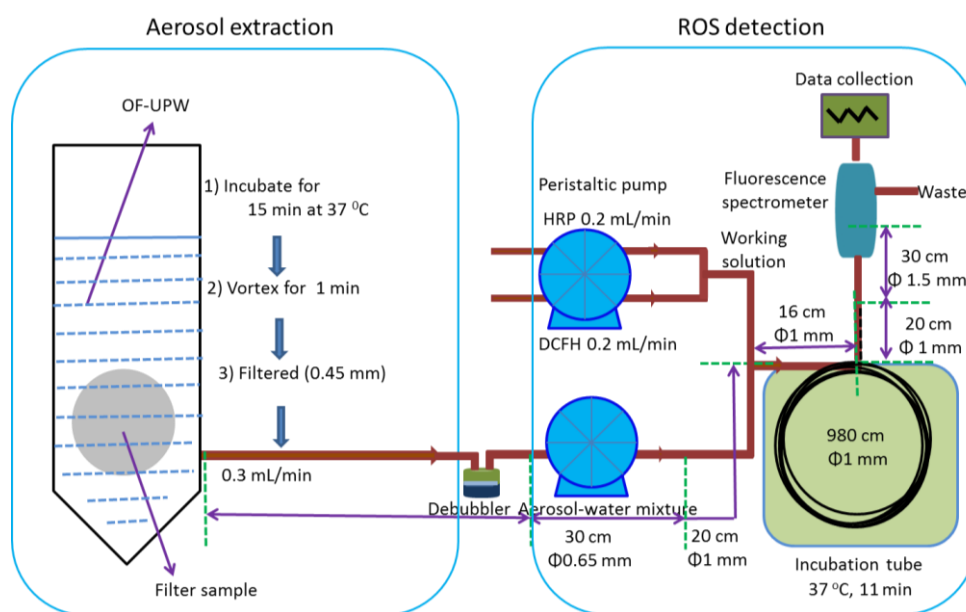
**Jun Zhou et al.**

*Correspondence to:* Josef Dommen ([josef.dommen@psi.ch](mailto:josef.dommen@psi.ch))

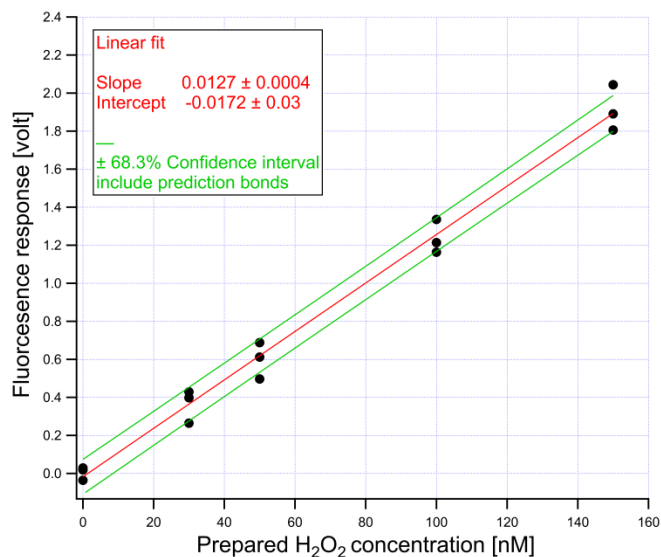
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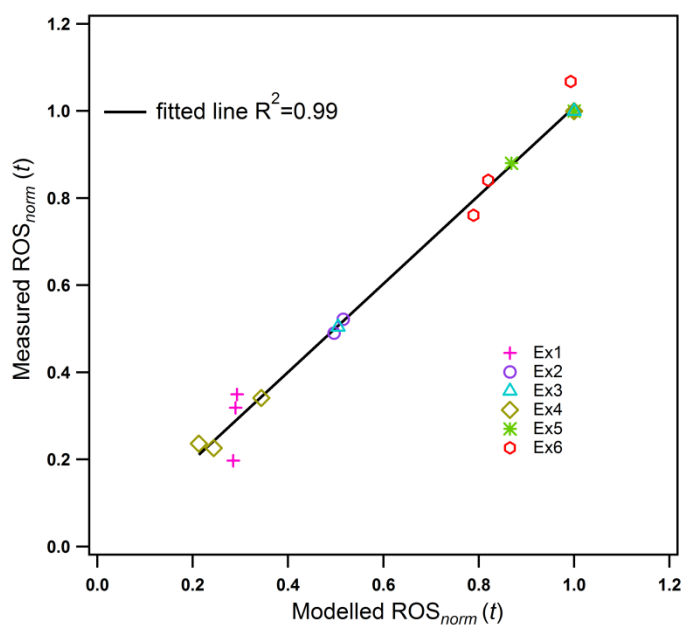
**Figure S1.** The reaction scheme of the DCFH assay (Miljevic et al., 2014).



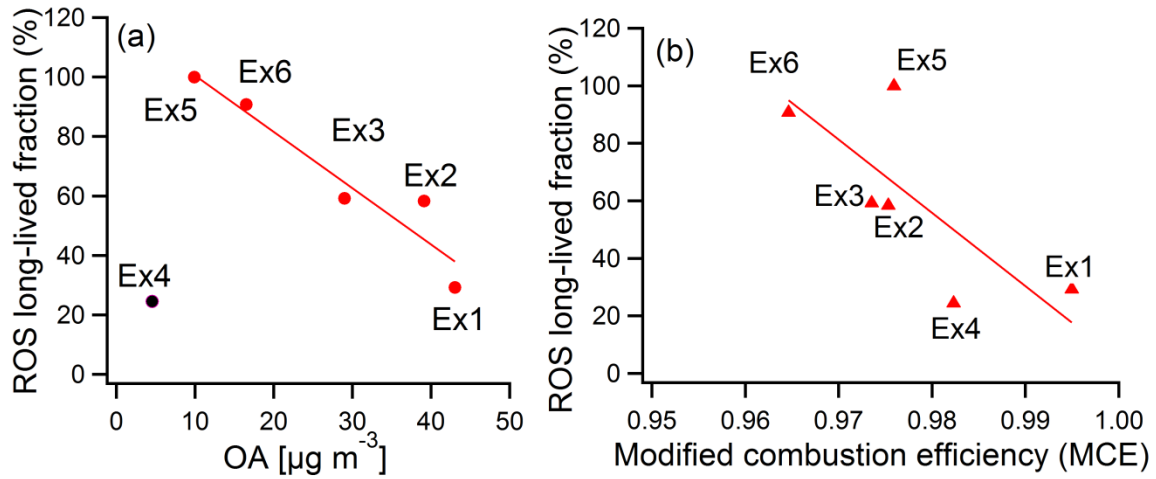
**Figure S2.** Overview of the offline ROS analyzer.



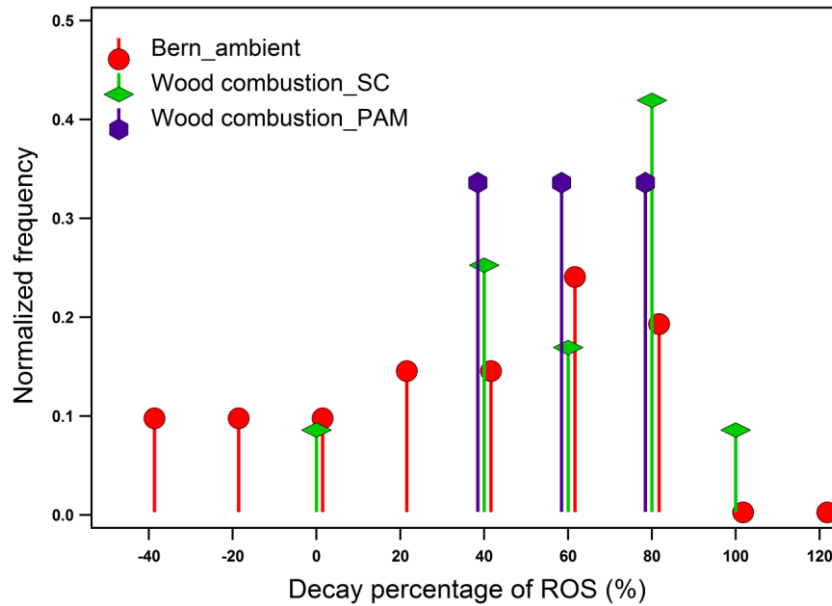
**Figure S3.** Average of calibrations of the ROS analyzer with different  $\text{H}_2\text{O}_2$  concentrations which were repeated three times.



**Figure S4.** Comparison of measured  $ROS_{norm}(t)$  and modelled  $ROS_{norm}(t)$ .  $ROS_{norm}(t)$  is the ROS measured at time  $t$  normalized to the ROS measured the first time ( $t_1$ ).



**Figure S5.** Long-lived ROS fraction as a function of OA loading (a) and modified combustion efficiency (MCE) (b). Markers indicate the modelled long-lived-ROS fraction (see section 3.4.2) and the solid lines a linear least-square fit.



**Figure S6.** Normalized frequency of ROS decay percentages. “Bern\_ambient” and “wood combustion\_SC” represent the results from Bern ambient air (filter storage time: 1 year) and wood combustion smog chamber aging (filter storage time: 2 years), respectively; “Wood combustion\_PAM” represents the estimated results from wood combustion potential aerosol mass chamber aging using the biexponential decay model described in section 3.4.2 (filter storage time: 1 year).