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Development of an antioxidant assay to study oxidative potential of airborne particulate matter

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Table S1. Molar concentrations (mol L^{-1}) of antioxidants CSH and GSH as well as their oxidation products CSSC and GSSG used for calculating Eh in Figure 4 of the main text

(mol L^{-1})	**CSH**	**GSH**	**CSSC**	**GSSG**
Reference SELF	1.7×10^{-04}	2.0×10^{-04}	3.5×10^{-06}	1.0×10^{-05}
SELF-PM [10]	1.2×10^{-04}	1.4×10^{-04}	8.2×10^{-06}	2.1×10^{-05}
SELF-PM [20]	8.6×10^{-05}	9.4×10^{-05}	1.4×10^{-05}	2.8×10^{-05}
SELF-PM [40]	1.4×10^{-05}	1.8×10^{-05}	2.3×10^{-05}	3.8×10^{-05}
SELF-PM [60]	7.1×10^{-07}	3.3×10^{-07}	2.9×10^{-05}	4.3×10^{-05}
SELF-PM [80]	7.1×10^{-07}	3.3×10^{-07}	2.9×10^{-05}	4.1×10^{-05}

Figure S1a The effect of SELF formulation on CSSC and GSSG formation rates following the addition of SRM1649 (20 µg mL^{-1}) and incubation time of 180 min

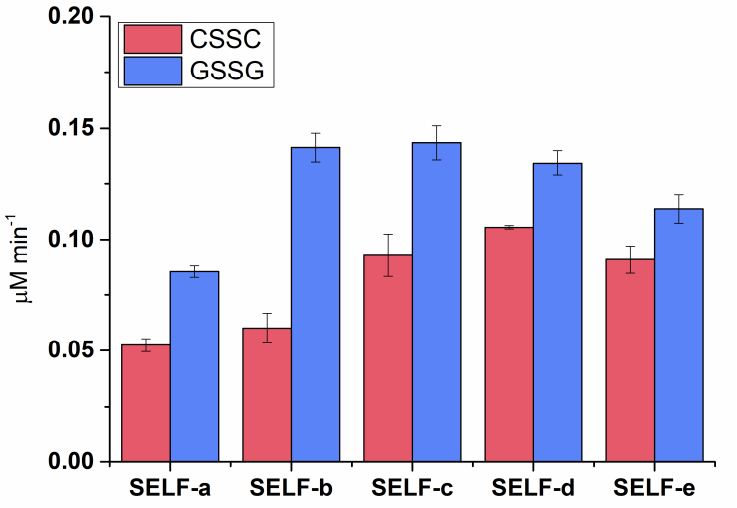
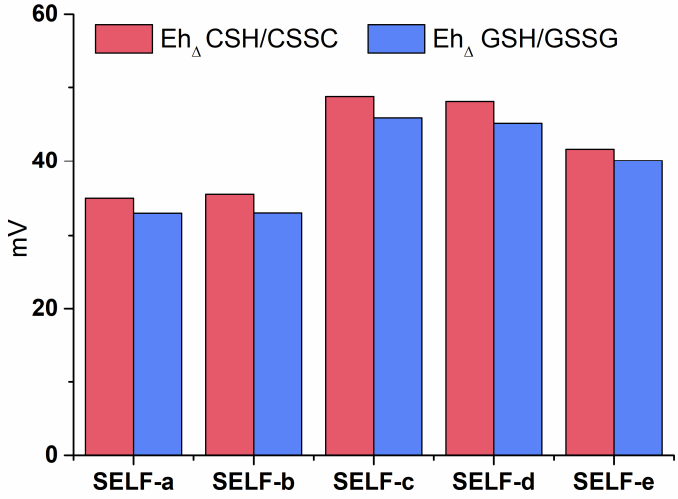


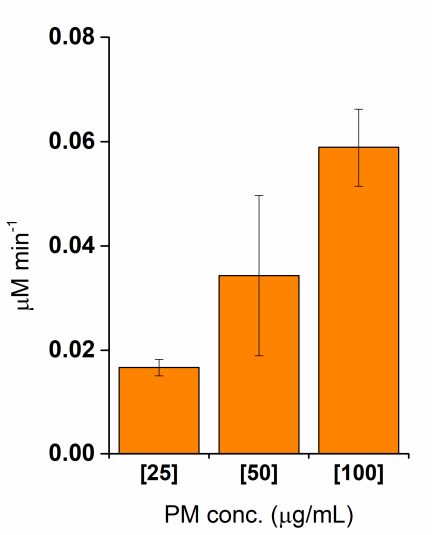
Figure S1b The redox state Eh (mV) of different SELF formulations following the addition of 20 µg mL^{-1} of SRM1649 and incubation time of 180 min; Δ denotes the difference in Eh between the SELF containing SRM and reference SELF



Section S1. Method description for the dithiothreitol assay

The Dithiothreitol (DTT) assay was performed following the procedure described in Tong et al., (2018). In brief, SRM1649 was incubated in phosphate buffered saline (PBS) containing KH_2PO_4 (0.05M; pH: 7.4), EDTA (1mM) and DTT (20µM) at 37°C for a total of 180 min. Subsequently, sub-samples were taken from the reaction mixture to which 5,5′-dithiobis(2-nitrobenzoic acid) (DTNB, 1mM) was added in order to quench the reaction. DTNB reacts with non-oxidised thiol groups on DTT to form TNB^-; a yellow reaction product that was quantified using a Synergy Neo 2 multi-plate spectrophotometer at 412 nm wavelength. DTT loss, due to reaction with SRM, is determined indirectly using measured concentrations of TNB^-. For data reduction, for each time-step a fresh DTT reference curve was made ranging from 20 to 0 µM DTT.

Figure S2 Dose-response relationship of the DTT assay to SRM (25-100 µg mL^{-1} in PBS) following 180 min incubation



References

Tong, H., Lakey, P.S.J., Arangio, A.M., Socorro, J., Shen, F., Lucas, K., William H. Brune, W.H., Pöschl, U., and Shiraiwa, M.: Reactive oxygen species formed by secondary organic aerosols in water and surrogate lung fluid, *Environ. Sci. Technol.*, 52, 11642–11651, doi:10.1021/acs.est.8b03695, 2018.