

Interactive comment on “Reactive oxygen species (ROS) emissions and formation pathways in residential wood smoke under different combustion and aging conditions” by Jun Zhou et al.

Anonymous Referee #1

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The manuscript presents novel data for the emission factors of reactive oxygen species (ROS) for several combustion devices commonly used in Europe. It also explores the effect of OH-induced ageing of smoke particles on their ROS content. The results of the ageing experiments highlight a complex behavior of redox-active compounds during ageing but the overall effect is a net increase with respect to purely primary emissions. Several interesting findings about the effect of burning conditions, burner operation, etc. are discussed in detail in the paper. The only aspect that, in this reviewer's opinion, has been neglected is about the employ of electrostatic precipitators

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for the abatement of pollutants and ROS. In particular, the Authors' conclusion that "the use of the electrostatic precipitator had little effect on the primary and aged ROS emissions" is not fully consistent with the data reported in Table 2, where the ranged of EF-ROS before ESP (1758 – 2034 nmol Kg⁻¹) is clearly smaller than after ESP (775 – 1098 nmol Kg⁻¹). Beside this particular information that, once clarified, is worth to be mentioned in the Abstract, I have only one general comment. In my view, the paper lacks of an adequate description of the context for this research. For instance, the Introduction section in its current form misses important references to previous works done on ROS in aged combustion emissions but for fossil fuel (e.g., for diesel: Ratanavaraha et al., *Atmos. Environ.*, 45, 3848-3855, 2011). References to past works on ROS associated to biomass burning aerosols but dealing with field measurements might be added (e.g., Verma et al., *Environ. Sci. Technol.*, 49, 4646–4656, 2015). Finally, studies dealing with the cytotoxicity of ambient biomass burning aerosols collected in variable photochemical conditions can be quoted as well (e.g., Corsini et al., *Sci Total Environ.*, v.587-588, 223-231, 2017). By expanding the context that the Authors feel appropriate for this laboratory research, its impact for the broader scientific community will become clearer.

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