

Interactive comment on “Formation and sink of glyoxal and methylglyoxal in a polluted subtropical environment: observation-based photochemical analysis and impact evaluation” by Zhenhao Ling et al.

Anonymous Referee #1

Received and published: 11 May 2020

This study investigating the contribution of GLY and MGLY to SOA based on observation and box modeling. Overall this study is of interesting based on the methods and results. However, improvements are needed for its publication. 1. The study used VOCs observations to drive the model with MCM mechanism, but there is no list of the VOCs. Are the species enough to drive the mechanism? If major species are missing, the chemistry may be messed up. 2. The SOA simulation was not validated, thus it is not clear if the contribution of GLY and MGLY are in realistic range. For example, the study may underestimate or overestimate SOA from other species. Also, SOA for-

C1

mation pathways are far from accurate, if corrections such as wall loss are considered in this study? It is important to make sure that what recent findings regarding SOA formation have been considered, as the total SOA prediction would be much different. 3. The basis for heterogeneous reactions are the comparison of gas phase of GLY and MGLY concentrations, which may cause uncertainties. Without validating the components formed by GLY and MGLY in SOA, it is misleading that GLY and MGLY are actually converted to SOA. 4. When considering the budget, it is import to considering transport. It is suggested to exclude the effects of transport in/out or note the readers regarding the uncertainties.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-212>, 2020.

C2