**Atmospheric
Chemistry
and Physics
Discussions**

# Interactive comment on "A comparison of the chemical sinks of atmospheric organics in the gas and aqueous phase" *by* S. A. Epstein and S. A. Nizkorodov

**H. Herrmann (Referee)**

herrmann@tropos.de

Received and published: 14 June 2012

General: An interesting contribution investigating aqueous phase sink strength due to OH reaction and photolysis.

Unfortunately there are a few methodic failures in the approach the authors take: Aqueous phase effective quantum yields are far from being equal to the gas phase quantum yields (page 10020, line 20ff) and so the derived aqueous phase photolysis frequencies are all too high. While the authors state that through this approach upper limits are derived, the danger is that the resulting photolysis rates are so unrealistcally high that the whole treatment does not lead to reliable data to judge wether solution phase

processes are comparable to gas phase processes with regrad to their efficiency. I find this approach too simplistic and the authors should at least use reasonable estimates of the effective solution phase quantum yields in question rather than applying the current crude approximation. Please search literature for solution phase quantum yields, conceptual treatments and estimations for effective quantum yields.

Second, the used LWC (page 10026, line 5) is absolutely unrealistic. 3 g/l is way too high. This has also to be corrected. See literature on cloud LWC for this.

Thirdly, an estimate of reaching aqueous concentration according to Henry equlibrium is not realistic, again. The severe deviations from this have been treated in multiphase modelling.

I do suggest major revision of this study in view of the above.

Details: Page 10018, line l5: There is no Ervens et al. (2011) in the references

———————————————

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 10015, 2012.