

## ***Interactive comment on “Heterogeneous reactions of carbonyl sulfide on mineral oxides: mechanism and kinetics study” by Y. Liu et al.***

### **Anonymous Referee #1**

Received and published: 29 June 2010

This manuscript reports mechanistic and kinetic study of interactions between OCS on various mineral oxides using two experimental methods (KCMS and UV-Vis). The results provide some insights into the reaction pathways for OCS on these oxides. The study also estimated uptake coefficients of OCS on mineral oxides, which can provide an estimate of the global flux of the OCS due to the heterogeneous reactions on atmospheric mineral oxides based on these kinetic parameters. The authors found a comparable flux of OCS to that of OCS with OH radicals. The topic is quite interesting and worthy of further investigation. However, the authors/coauthors have published a series of papers in several other journals on the heterogeneous reactions of OCS on several similar oxides using different experimental methods (e.g. DRIFTS) and drew similar conclusions for the same reactions [e.g., Liu LF et al. 2006; Liu YC et al., 2008a,b, 2007a,b, 2009 a,b]. The only new information reported in this study is the

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uptake coefficient of OCS on various mineral oxides, which is not worthy of a long paper (about 30 pages). Except for this piece of information, the reviewer feels that the authors would like to mainly confirm the previous experimental results rather than make a significant contribution to this research area. The reviewer also recommends that a shorter paper on the kinetic uptake coefficients of OCS on these mineral oxides might be publishable in other journal such as Journal of Physical Chemistry A/B. It should be pointed out that the reviewer doesn't agree with the authors that the uptake of OCS on ZnO is irreversible (page 12317) since Figure 5 show clearly no any sign of irreversible uptake behavior.

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 12309, 2010.

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