

Interactive comment on “The atmospheric chemistry of sulphuryl fluoride, SO₂F₂” by T. J. Dillon et al.

Anonymous Referee #2

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General comments

This paper reports a quite extensive study of the atmospheric chemistry of sulfuryl fluoride which is a widely used fumigant. The atmospheric implications of this study indicate that this compound has no significant loss process in the troposphere and a very long lifetime in the stratosphere, and it has a significant global warming potential. These conclusions are based on laboratory studies of reaction kinetics and infra-red spectroscopy for this compound. The reactions investigated are those with O(1D), OH, O₃, and onto aqueous surfaces. The rate coefficient for the reactive loss of O(1D) reaction was determined while only upper limits were obtained for the reaction rate coefficient with OH and O₃ and for the uptake coefficient onto aqueous surfaces. These results have been obtained using three outstanding experimental methods (PLP-LIF/RF,

relative rate method with FTIR analysis and wetted-wall flow tube). The work has been carefully executed and the analysis of the results is appropriate and clearly described.

Specific comments

p. 15226: reaction of O(1D) with SO₂F₂: although no sulphur containing products could be identified it might be interesting to speculate on some possible products and their formation mechanisms.

p. 15227: reaction OH + SO₂F₂: the impurities of the SO₂F₂ sample (up to 1%) could account for the reactivity observed. Was it not possible to have some indication about the nature and concentration of the impurities?

Technical corrections:

p. 15225: 590 cm⁻¹ instead of 590 nm.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 15213, 2007.

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Interactive Discussion

Discussion Paper