**Table S1.** Typical Concentrations of S Gases in the Remote Troposphere (reprinted from Seinfeld and Pandis, 1998; attributed to Berresheim et al., 1995).

Compound and Location Average Mixing Ratio (pptv)

H2S

 Marine surface layer 3.6-7.5

 Coastal regions 65

 Forests 35-60

 Wetlands 450-840

 Urban area 365

 Free troposphere (2-5 km) 6-8.5

CH3SCH3

 Marine surface layer 80-110

 Continental surface layer 8-60

 Free troposphere (2-5 km) 1.5-15

CS2

 Marine surface layer 2-18

 Continental surface layer 35-120

 Free troposphere (2-5 km) 5-7

OCS

 Marine surface layer 500

 Continental surface layer 545

 Total troposphere 500

SO2

 Marine surface layer 20

 North America clean continental 160

 Coastal Europe 1500

 Free troposphere (2-5 km) 50

 (Europe/North Sea/Arctic)

**References for Supplemental Material**

Berresheim H. Wine P, Davis D. 1995. Sulfur in the atmosphere. In Singh H,ed., in *Composition Chemistry and Climate of the Atmosphere*. New York: Van Nostrand Reinhold, p. 251-307.

Seinfeld J, Pandis S. 1998. *Atmospheric Chemistry and Physics.* New York: Wiley Interscience.