

Chemical Kinetic Model for the Lower Atmosphere of Venus

Vladimir Krasnopolsky

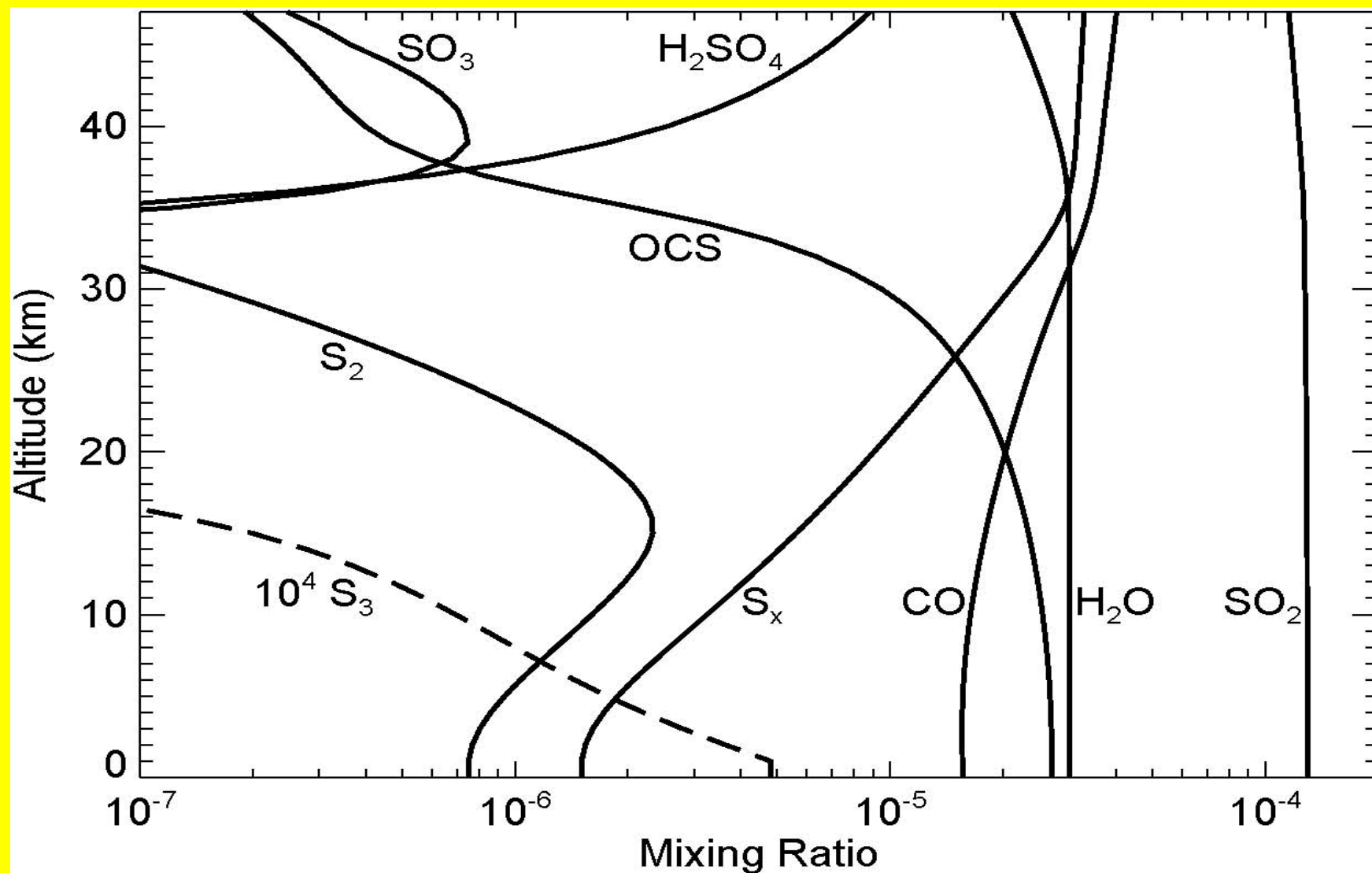
First self-consistent model for the Venus atmosphere below clouds (0-47 km)

Chemistry is driven by

- 1) photochemical products from the middle atmosphere (SO_3 , CO , S_x)
- 2) thermochemistry in the lowest 10 km
- 3) photolysis of S_3

26 species, 64 reactions

Basic Chemical Species



Conclusions

- S-bonds in OCS and S_x are weaker than other chemical bonds, and chemistry below 47 km is sulfur-driven
- The model results agree with the observations of H_2SO_4 , CO, OCS, and S_3
- Predicted abundances of $ClSO_2$ and SO_2Cl_2 are very low ($\sim 10^{-11}$)
- The current concept of sulfur cycles is incompatible with the observations and has been significantly revised