

SULFUR AND NITROGEN CHEMISTRY IN LONG-RANGE TRANSPORT MODELS

Mark Twain: "One gets such wholesale returns of conjecture out of such trifling investment of fact."

INTRODUCTION

The purpose of this review is to present the state of knowledge of the chemistry of sulfur oxides and nitrogen oxides that is thought to be important for acid precipitation. The simple chemistry used in the long-range transport (LRT) models will be compared to the fundamental reaction schemes.

This review is organized into four principal parts:

Atmospheric Processes

- o global S and N cycles
- * o pathways, processes influenced by human activity
- o role of models

Chemistry of Oxides of Nitrogen, Organics and Oxidants

- o clean tropospheric chemistry
- o polluted tropospheric chemistry
- o laboratory evidence of the NO₂-to-precursor relationships
- o NO_x-oxidant chemistry in plumes

- o computer simulation of atmospheric chemistry
- o nitrite and nitrate formation

SO₂-Oxidant Chemistry in the Lower Troposphere

- o gas-phase chemical reactions of SO₂
- o aqueous-phase chemical reactions
- o surface chemical reactions
- o estimates of SO₂ oxidation

Survey of Chemical Modules