

STUDY ON MODELING PARAMETERS FOR DISTRIBUTION OF WET DEPOSITION OF SULFATE IN EAST ASIA

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A major air pollutant in the early 1990s in China has been sulfur dioxide (SO₂) emitted from coal combustion effluents. The high atmospheric concentrations resulted in acidic wet depositions which caused damages not only on ecosystem but also on economics through agricultural loss. In a previous study, authors have shown distribution and decreasing tendency of SO₂ concentration in China based on data analysis and box model predictions. Subsequently, questions were raised about changes of wet deposition of sulfate in near future. Therefore, authors have planned to develop a simulation model which describes distribution of wet deposition of sulfate in eastern Asian area using SO₂ concentration as a variable. In this study, feasible modeling parameters were investigated by deriving from 2-year compiled monitoring data of Intergovernmental Meeting on the Acid Deposition Monitoring Network in East Asia (EANET) covering wet and dry depositions at 43 sites in 10 countries. A scavenging ratio, which parameterizes a relationship between atmospheric and precipitation concentrations of sulfur species, ranged from 70 to 8000: higher in tropical forest zone and high latitudes. On the other hand, gas-particle distribution factors between SO₂ and sulfate in dry depositions ranged 0.16 to 0.95: higher in Japan and inland China. Using these empirical parameters and observed chemical composition of precipitations, changes of precipitation pH at Chinese urban cities were estimated by inputting changes of atmospheric SO₂ concentration predicted along with some scenarios.