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The Assessment Modelling and Impacts of Chemical Transformations of the Air Pollution

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Initial studies at the anthropogenic climate change used simple experiments. More recently simulations incorporating coupling between climate and chemistry have been continued. The various stages in influence on the anthropogenic climate a change by chemical pollution will be outlined.
Evident is accumulating that anthropogenic pollution increase has caused detectable climate change.
Remaining uncertainties arise from the difficulty in separating the contributions from different forcing agents (such as sulfate aerosols, solar forcing and volcanism) and from model-based estimates of natural climate variability. Aerosols play an important role in the global climate system. However, their distribution, chemical transformation and removal in distant atmospheric transfer and mixing state on global scale are not known satisfactorily, leading to large uncertainties in the estimates of their radiative forcing.
To gain more insight into this complex atmospheric system, author offer of the perspective model of chemical transformation of sulfur and nitrogen compounds during long distance transfer.
The compounds of sulfur and nitrogen were known as one of the most widespread pollutants of the natural environment. Except of the power system their basic suppliers are color and ferrous metallurgy, the enterprises of manufacture of mineral fertilizers and motor transport.
The condition of compounds of sulfur and nitrogen, transferable in an atmosphere on distances about hundreds kilometers, depends on a plenty of the factors determining speed of their chemical transformations and removal from an atmosphere.
Modelling calculations of transfer and fallout of compounds of sulfur over territory of Europe, has been executed within the framework of the all-European Program of the estimate and monitoring of distant transfer of pollutants in an atmosphere. This calculations are carried out with use generalized and constant in time of coefficients of speeds of chemical transformation of sulfur dioxide without taking into account changes of a chemical compound of air during transfer. Interrelation between chemical system of compounds of sulfur and chemical system of compounds of nitrogen are ignored. Also daily change of concentration of the free radicals determining speed of oxidation of compounds of sulfur and nitrogen in the afternoon was not taken into account, and reactions of formation of the nitric acid, proceeding at night were not taken into account. Further attempts of modelling of the transfer have been made with account set forth above factors but these models are too complex that they could be applied in the current operative calculations.
In this work presents simple model of chemical transformations and deducing of compounds of sulfur and nitrogen on underlaying surface during distant atmospheric transfer. The substances enter reactions with each other and with formed free hydroxyl and hydro-peroxide radicals in the process of the transfer.
The executed researches have shown, that the heterogeneous processes on a surface of aerosol particles are very important role in transformation of gaseous products The speed of heterogeneous oxidation of sulfur dioxide has been described by exponential law in offered model
Examples of studying of effect of influence of compounds of nitrogen on speed of chemical transformations of compounds of sulfur have shown, that sulfur dioxide and nitrogen oxides compete among themselves for the participation into reaction of oxidation with free radicals. Thus speed of reaction between nitrogen oxides and free radicals is essentially higher. In case of simultaneous presence of the mix of sulfur dioxide and nitrogen oxides at the polluted atmosphere at the first stage of transfer the nitrogen oxides interfere to reaction of oxidation of sulfur dioxide and formation of a sulfuric acid. It is create conditions for their transfer on farther distances.

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