

K.003 Atmospheric Chemistry Research from Fundamentals to Policy Relevance - Recent Research Experience -.

Presenting Author:

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Abstract:

The three-leg view on atmospheric chemistry research is widely accepted in the IGAC community (Melamed et al., 2015). I will propose an alternative slightly modified four-element view including “policy relevance” explicitly.

In my talk, I will cover the following three topics based on our recent research experience referring to the policy relevance in the above scheme.

1. Ozone prediction and control strategy based on chemical transport models

Tropospheric ozone chemistry mainly based on the homogeneous gas-phase chemical kinetics is thought to be matured in general. However, our recent studies in MICS-Asia III revealed that there exists substantial disagreement among the CTMs and between model simulation and observation, which may affect policy proposal.

2. Chemistry and physics of secondary organic aerosols

In contrast to O₃, which has been investigated more than 40 years, atmospheric chemistry on tropospheric fine particles typified by PM_{2.5} is still pre-matured, and the studies are going on most actively now. In order to obtain reliable source apportionment of PM_{2.5}, which is more policy relevant, studies to quantify atmospheric processes has to be established incorporating fundamental research.

3. Air quality-climate interaction and SLCP co-control strategy

In order to mitigate extreme events induced by global warming in next 30 years, co-control of SLCPs is the only way to achieve. Climate sensitivities of O₃, CH₄, BC and white aerosols per unit RF_{TOA} has to be evaluated more precisely in order to propose more solid co-control measures. Quantification of CCN activities of aerosols based on chemical structures has to be studied fundamentally also.

Melamed, M. L. et al., *Anthropocene*, 12,17-28, 2015.