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Biological and non biological aerosols and their impact on health and environment

By

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Abstract

Awareness of air quality has led to numerous studies on the chemical composition and physical properties of the ambient aerosols and determination of pollution sources. Aerosol particles are injected into the atmosphere from natural and anthropogenic sources. Atmospheric aerosols are recognized to be of concern in health related effects and to have a strong impact on the environment. In addition, generation of particulate and liquid aerosols is an inevitable result of military operations during both peacetime and wartime. Aerosolized materials must be taken into account when planning and preparing an effective defense against chemical and biological weapons. Recent epidemiological studies have demonstrated that aerosols in the urban areas has a clear correlation with the respiratory and cardiovascular diseases responses. Pope et al. (2002) determined that each $10\mu\text{g}/\text{m}^3$ increase in fine particle concentration was associated with an approximate 4%, 6% and 8% increase in risk of all cause, cardiopulmonary and lung cancer mortality, respectively. Atmospheric aerosols influence many atmospheric processes including cloud formation, visibility variation and solar radiation transfer and play a major role in acidification of clouds, rain and fog. As well as their impact on plant photosynthesis. Both gaseous and particulate components of atmospheric aerosol contribute to the deterioration of air quality. In order to understand the sources, behavior and mechanism of particles in the atmosphere, it is important to measure both size distribution and chemical composition of ambient particles. Emission control of the aerosols into the atmosphere based on the destroy of the pollutants, changing pollutants to less harmful forms through chemical reactions, and collecting pollutants using air pollution control systems before they reach the atmosphere.

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