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Chemical composition of aerosols, a fragile barrier between healing and wounding

Aerosols are air suspended mixture of solid and liquid particles varying especially in size and chemical composition. For anthropogenic source related aerosols, origin is a third factor controlling their distribution. Coarse particles (PM₁₀) are mainly of natural origin while fine (PM_{2.5}) and ultrafine (PM_{0.1}) particles derive from anthropogenic sources and from photochemical induced processes. Aerosols play an important role in climate change. Nowadays the interest towards aerosols is increasing because they influence visibility, contribute to acid rain and have high potential to affect human health. Fine and ultrafine particles, often of very complex chemical composition (i.e. sulphates, nitrates, acids, metals and carbon loaded particles) are the most susceptible to be breathed most deeply in the lungs. However, the mechanisms by which ultrafine particles penetrate through pulmonary tissue and enter capillaries are still unknown. There are reliable measurements clearly showing that World Health Organization (WHO) recommendations in terms of atmospheric aerosols levels are overwhelming for certain periods in some world's area. In specific area, most probably the high aerosol levels are probably linked to the high rate of various pulmonary diseases. However, in medical practical applications, the efficiency of aerosols and nanoparticles in prevention, care and cardio-respiratory function improvement is believed to depend on aerosols life time, abundance and shape, which should be very strictly controlled. There are reports showing that selected halides might influence the generation mechanism of saline aerosols. These findings might have potential implications in the optimization processes of particles generation by dynamic halochambers used in various medical applications.

Biography

Cecilia Arsene graduated in Chemistry from the "Alexandru Ioan Cuza" University of Iasi, Romania. In 2001 she received a PhD degree (Doktors der Naturwissenschaften, Dr. rer. nat.) at the Bergischen Universität Gesamthochschule Wuppertal, Germany. Between 2005-2007 she performed Postdoctoral Research at the University of Crete, Greece. From February 2015 she is a Professor in Chemistry at the "Alexandru Ioan Cuza" University of Iasi, Romania. Her research interests include kinetics and mechanisms of different oxidation processes, investigations of various gas-to-particle conversion processes, aerosols chemical composition and chemistry. She has published more than 40 research papers in peer reviewed international journals.

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