

Measuring of Hetrogenenous Ice Nucleating Particles (INPs) Concentrations in the Atmosphere Using Impingers

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Atmospheric aerosols have an impact on the climate through direct and indirect interactions with solar radiations. Ice nucleating particles in the atmosphere have an influence on cloud radiative properties and the hydrological cycle. Ice nucleating particles (INPs), which are a small fraction of the total aerosol population, are capable of catalyzing ice formation under normal atmospheric conditions. We introduced aerosol species which have been identified in the past as potentially important INPs and addressed their ice nucleating abilities when immersed in supercooled droplets. Then comparisons were made with literature and existing parameterizations which describe ice nucleation according to singular approximation. We found that the type of aerosol that makes INPs in Leeds, UK was dominantly K-feldspar. It is also quite striking that our observations showed significant day-to-day variability in the INPs concentration. For example, at an activation temperature of -20 °C, the INPs concentration varies by nearly 2 orders of magnitude. We noted that the days on which we measured the highest INP concentrations were windy days. It indicates that INPs concentration depends on the local metrological parameters like wind speed, humidity and origin of air mass.