Geophysical Research Abstracts, Vol. 7, 00482, 2005
SRef-ID: 1607-7962/gra/EGU05-A-00482

Laboratory Studies of Ice Formation via Deposition Mode Nucleation onto Dust Samples

Z. Kanji and J. P. D. Abbatt

Dept. of Chemistry, University of Toronto, Toronto Ontario, Canada
(zkanji@chem.utoronto.ca / Fax: 416 946 7359 / Phone: 416 946 7359)

Laboratory studies are described whereby the heterogeneous ice nucleating ability of various dust samples was studied for particles mounted on a hydrophobic support. Ice formation is observed using digital photography, and the relative humidity (RH) and temperature conditions of the flow system are validated by observing $(NH_4)_2SO_4$ deliquescence. Four types of dust samples, including authentic Saharan dust, alumina, silica and montmorillonite, were investigated in the vapour deposition freezing mode. The size of the dust particles ranged from 1 to 5 microns, and the temperature range was from 263 to 233 K. Surprisingly, the 263 K results showed ice nucleated at RH with respect to ice as low as 103%, and the nucleation onset RH was not observed to alter significantly with temperature. This indicates that at both high and low temperatures, including the conditions where cirrus clouds prevail, dust can be an important precursor to ice cloud formation.