



## Ice nucleation activity of polysaccharides

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Heterogeneous ice nucleation is an important process in the atmosphere. It shows direct impact on our climate by triggering ice cloud formation and therefore it has much influence on the radiation balance of our planet (Lohmann et al. 2002; Mishchenko et al. 1996). The process itself is not completely understood so far and many questions remain open.

Different substances have been found to exhibit ice nucleation activity (INA). Due to their vast differences in chemistry and morphology it is difficult to predict what substance will make good ice nuclei and which will not. Hence simple model substances must be found and be tested regarding INA.

Our work aims at gaining to a deeper understanding of heterogeneous ice nucleation. We intend to find some reference standards with defined chemistry, which may explain the mechanisms of heterogeneous ice nucleation. A particular focus lies on biological carbohydrates in regards to their INA. Biological carbohydrates are widely distributed in all kingdoms of life. Mostly they are specific for certain organisms and have well defined purposes, e.g. structural polysaccharides like chitin (in fungi and insects) and pectin (in plants), which has also water-binding properties. Since they are widely distributed throughout our biosphere and mostly safe to use for nutrition purposes, they are well studied and easily accessible, rendering them ideal candidates as proxies.

In our experiments we examined various carbohydrates, like the already mentioned chitin and pectin, as well as their chemical modifications.

Lohmann U.; A Glaciation Indirect Aerosol Effect Caused by Soot Aerosols; *J. Geoph. Res.*; Vol. 24 No.4; pp 11-1 - 11-4; 2002

Mishchenko M.I., Rossow W.B., Macke A., Lacis A. A.; Sensitivity of Cirrus Cloud Albedo, Bidirectional Reflectance and Optical Thickness Retrieval Accuracy to Ice Particle Shape, *J. Geoph. Res.*; Vol. 101, No D12; pp. 16,973 - 16,985; 1996