



Growing individual artificial frost flowers and first results from 3D X-ray micro computer tomography

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Sudden loss of boundary layer ozone during springtime is a recognized phenomenon of both Polar Regions. Air masses that are depleted in ozone are associated with passage over sea ice, and in particular, newly-formed sea ice. Frost flowers are often produced on the surface brine slush during the formation of fresh sea ice. They are highly saline and have a large surface area, and are potentially a significant source of reactive halogens to the atmosphere. In addition, there is also evidence that frost flowers might constitute a significant source of sea salt-aerosol to the atmosphere, which has direct implications for the interpretation of corresponding ice core records. In both cases, the potential source strength will depend on the concentration and spatial distribution of salts in or on the frost flowers and the sea ice surface. These will likely vary depending on the environmental condition during growth and ageing of frost flowers. In order to study the processes governing the composition of frost flowers in the laboratory we developed a method to reproducibly grow and age individual frost flowers on small droplets of salt solutions. Here we present this method and show first 3D X-ray computer tomography pictures from artificial frost flowers grown with this method.