Frost flowers – one of the causes of the ozone depletion?

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Frost flowers are highly saline ice structures that grow from a saturated water vapor layer on a young sea ice and sporadically on frozen lakes.[1-4] An important factor must be fulfilled, specifically, that the temperature of the air above the ice has to be at least 20 °C lower than the temperature of water under the ice.[4] Depending on the original position of the brine covering the ice, namely, if it was located on the ice surface or buried in-between the ice crystals in the vein channels and pockets, the sublimation of the surrounding ice may increase the brine surface area several times or even more than an order of magnitude. This could potentially accelerate the heterogeneous reactions; one particularly important reaction is bromine liberation, which is believed to be the direct source of bromine from the saline particles in polar regions.[3, 5] Frost flowers broken to small fragments during ice sublimation were suspected to be the source of the saline particles in the atmosphere. We prepared frost flowers and examined their gradual sublimation on environmental scanning electron microscopy (ESEM).

The participation of the frost flowers in bromine explosion was disproved by our experiments.

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