

## Experimental Studies of Sublimation of Highly Volatile Ices in Relevance to the Ices of the Solar System

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### A b s t r a c t

Studies of sublimation of complex ices prepared by deposition of gaseous CO, CH<sub>4</sub>, N<sub>2</sub>, and NH<sub>3</sub> molecules on a cold plate have been performed. The low pressure and low temperature system was used: 10<sup>-9</sup>-10<sup>-5</sup> mbar and the lowermost temperature 10 K. Diagnostic of composition of evaporates (at an actual temperature) was done by means of the mass spectrometer. The latter allowed following simultaneously the partial pressure of five different ions or radicals escaping from the substrate. It has been found that highly volatile molecules that were used simultaneously with the low volatile ones to form the complex ices (mixtures or clathrates) present a different sublimation pattern than the sublimation of pure high-volatile ices. In particular, the high-volatile component sublimates at two or even three different temperature regimes: At low temperature that is typical for sublimation of this component, as well as at much higher temperatures. This effect seems to be important when degassing and outbursts from cometary nuclei are considered. It can be also important for modeling of cryovolcanic processes on the icy satellites.

**Key words:** clathrates, comets, ices, sublimation, satellites.