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CONDENSATION EXPERIMENT OF ICES FROM THE INTERSTELLAR GAS

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Abstract: The importance of ices on the evolution of interstellar space is widely recognized. Some studies, both experimental and theoretical, have been carried out on the condensation of ices from the interstellar gas. However, phase relation of multi-component ices have not be investigated.

We have been performing condensation experiment of ices from the gas of interstellar composition analog at temperatures between 10 and 150 K. The structure and chemical composition of the ices are analyzed as a function of condensation temperature by mass spectrometry and X-ray diffraction, respectively. Amorphous-crystal transition of the ices except for H$_2$O ices are also investigated. The result of the experiment will be presented.

COMMENTS

K. ROESSLER

Does it make a difference if you take round condensation plates, crude surfaces (like in space) instead of your experimental plates for condensation?

Answer:

I could not answer at present. However, we are planning to perform such experiment using very fine particles about $1000 \sim 10000 \text{ Å}$ in diameter made by gas evaporation method.

B. HALE

Can you estimate the temperature derivative of the vapor pressures from yours data?

Answer:

Although it is possible, we did not estimate because the precision of measurement of vapour pressure is bad.

D.D. KLUG

What was your condensation rate used to determine the transition temperature for amorphous to cubic ice as a function of condensation temperature? How would you expect the transition temperature to change with a change of condensation rate?

Answer:

Condensation rate is about $2000 \text{ Å}/\text{hour}$.