by Jok Church

BEAKMAN JAX

I CAN !

Dear Beakman,
How can ice cubes disappear in the trays in the freezer ?

Nancy Calavan
Santa Rosa,
California

Beakman or Jax
1130 Walnut Street
Kansas City, MO 64106
Questions, name & address

myQuestion@beakman.com

Google: sublimation phase change

Dear Nancy,
Solid water (ice) can evaporate without the whole chunk of water needing to boil.

The fancy name for it is sublimation (sub-leh-MAY-shun). You see it done more quickly with what we call dry ice. The solid carbon dioxide turns into CO_2 gas without needing to be a liquid on the way there.

Beakman

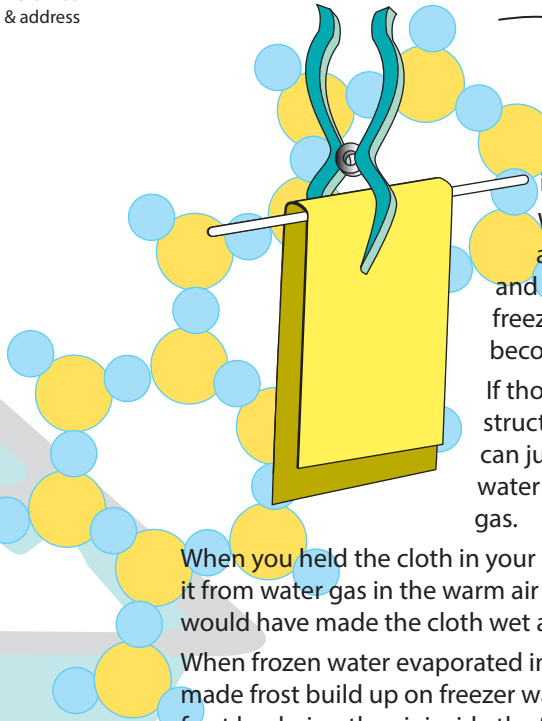
Beakman Place

:STUFF TO DO:

Wet a small piece of cloth until it's soaking wet. Use a clip to hang it from one of the racks inside your freezer – somewhere in the back where you can forget about it for a while.

After a long time, like 2 months, reach in and squeeze the cloth between your hands. Press tighly and try to feel the difference between wet and cold. Keep holding on and take it out of the freezer and don't let any air get to the part of the cloth you're holding and keep holding on until it warms up. When you open your hands, you'll find the cloth is dry or more dry than the soaking thing you stuck inside on that clip.

The shapes behind my letter are how H_2O can look (1 atom oxygen and 2 atoms hydrogen). The pattern behind our clip is how H_2O can make the solid we call ice. Even the tiniest amount of heat energy can break H_2O molecules off that solid structure.



Even your cold freezer has some heat energy in its inside air.

When heat energy is absorbed by frozen H_2O and the temperature is above freezing, those H_2O molecules become water.

If those H_2Os break off the structure and it is freezing, they can just float off, becoming water vapor, which is water as a gas.

When you held the cloth in your hands, you were protecting it from water gas in the warm air outside your freezer that would have made the cloth wet again.

When frozen water evaporated in a freezer in olden times, it made frost build up on freezer walls. Modern freezers stop frost by drying the air inside the freezer. The water drains out as a liquid – the liquid that used to be your shrinking ice

P.S. from Jax: Freeze-drying is another kind of sublimation. Frozen stuff, like coffee, is put in a vacuum chamber and the water just evaporates.