

Re: Shake some supercooled water and you get ice, why?

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- *From:* andy everett <[vze2qxq3@xxxxxxxxxxx](mailto:vze2qxq3@xxxxxxxxxxx)>
  - *Date:* Sun, 18 Feb 2007 15:28:02 GMT
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Edward Green wrote:

On Feb 18, 8:22 am, andy everett <[vze2q...@xxxxxxxxxxx](mailto:vze2q...@xxxxxxxxxxx)> wrote:

While in my father's cold garage I noticed a bottle of water that was unfrozen. Knowing that the average temperature in the garage should have averaged well below freezing I was surprised that the water was unfrozen. I picked up the bottle examined it and set it down and went back to work. Moments latter I looked at the bottle and was surprised to find it about 80% frozen (from this fact I should be able to determine its past temperature?).

Now that I think of it I have noticed the same effect with canned soda.

I have searched Google and can't find a link that will explain the physics, why gentle motion is enough to upset an unstable equilibrium.

Can anyone point me to an appropriate link or give a quick explanation?

"The Freezing of Supercooled Water", N. Ernest Dorsey, Transactions, American Philosophical Society, Volume 38, Part 3, 1948

<<http://tinyurl.com/2mwvzv>>

Journal articles online! Thank you.

or

<<http://books.google.com/books?id=XFoLAAAAIAAJ&pg=PA283&lpg=PA283&dq=supercooled+mechanical+agitation&source=web&ots=kT2gLNSP2y&sig=NQXztcKgQTEcxs5IzmydDQGvvyE#PPA247,M1>>

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Google, all is forgiven!

I was going to make some glib remark about mechanical agitation promoting nucleation, but that's really nothing more than repeating your original observation, along with some buzzwords.

I'm stuck trying to figure out the rotational state of water molecules at 0 degrees. If we have a fair amount of rotational energy it must efficiently be reduced to near zero? to form a crystal. Maybe the slight sloshing of water causes the molecules to aggressively "bump" into each other allowing rotational motion to cease.

I suspect the above is lame, %^)

Too many questions.

I don't know if anybody has elucidated a detailed mechanism since 1948.

We have all Sunday, lets figure it out!

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