

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

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- *From:* "Edward Green" <[spamspamspam3@xxxxxxxxxxxxx](mailto:spamspamspam3@xxxxxxxxxxxxx)>
  - *Date:* 18 Feb 2007 08:00:45 -0800
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On Feb 18, 10:28 am, andy everett <[vze2q...@xxxxxxxxxxxxx](mailto:vze2q...@xxxxxxxxxxxxx)> wrote:

Edward Green wrote:

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

We have all Sunday, lets figure it out!

Oish. The problem with continually pontificating "let's stop insulting each other, and discuss some physics", is that sooner or later somebody will call your bluff, and actually want to discuss some physics. This requires work.

First we might start by reviewing the general theory of nucleation and phase transformations. Then we should do an extensive literature review, probably by finding articles citing Dorsey. This may take more than one Sunday. :-)

Anyway, as you probably know, it is widely accepted that condensed phases are unstable below a certain threshold, even when thermodynamically favored in the bulk, and hence must first nucleate, meaning that a sufficiently large region of the new phase is formed so that it can grow by adding molecules to essentially the bulk phase.

One thing I've noticed is that supercooled liquids, on freezing, tend to form slurries. This means there is not one or two nucleation sites (which would lead to dendritic growth), but many appearing almost simultaneously, creating a porridge of tiny crystals. Whatever happens, at least sometimes, seems to happen throughout the bulk. Knocking the liquid achieves this. Do microbubbles form nucleation sites?

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