Freezing point of water with respect to pressure.

I know when the pressure is reduced, the boiling point of water is reduced as well. But how does the pressure affect the freezing point of water ?

In a low pressure environment is the freezing point more then 0 C or less ?

water pressure freezing

asked Apr 5 '13 at 18:32
Marwan Doumit
113 1 1 5

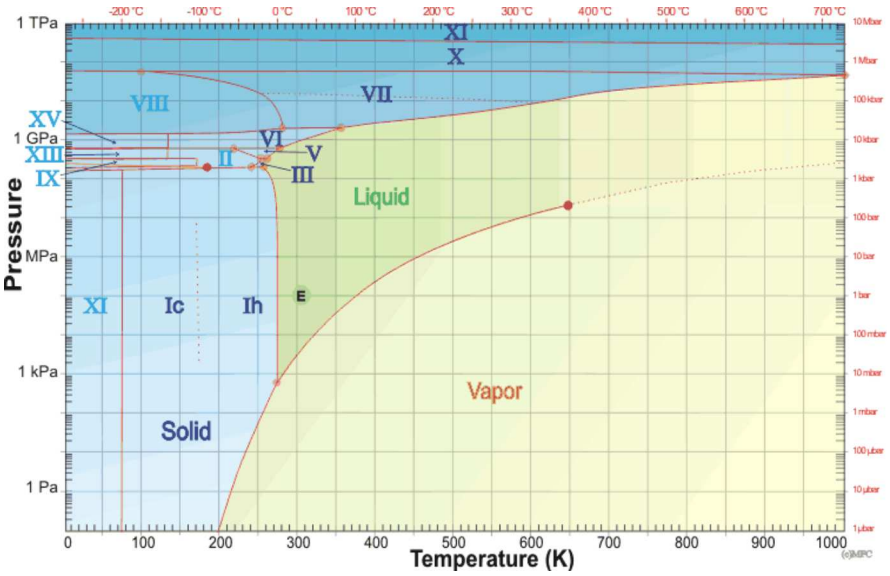
2 Answers

If you decrease the pressure, the freezing point of water will increase ever so slightly. From 0° C at 1 atm pressure it will increase up to 0.01° C at 0.006 atm. This is the tripple point of water. At pressures below this, water will never be liquid. It will change directly between solid and gas phase (sublimation). The temperature for this phase change, the sublimation point, will decrease as the pressure is further decreased. To learn more details, image google "water phase diagram" and study the pictures.

answered Apr 5 '13 at 19:13
jkej
2,176 3 17

Alright that settles my curiosity thank you. – Marwan Doumit Apr 5 '13 at 19:23

You can have a look at the phase diagram pressure-temperature of water:



[Phase diagram taken from Martin Chaplin's webpage, http://www.lsbu.ac.uk/water/phase.html#b\ , under license CC-BY-NC-ND. This webpage is highly recommended, with tons of useful links and articles.]

The transition between solid and liquid is the red line separating the blue (solid) and dark green (liquid) zones. It is quite clear that it is mostly constant when pressure is increased even up to 200MPa (atmospheric pressure is more or less 0.101MPa and also when it decreases.

edited Apr 6 '13 at 10:43

answered Apr 5 '13 at 19:18
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