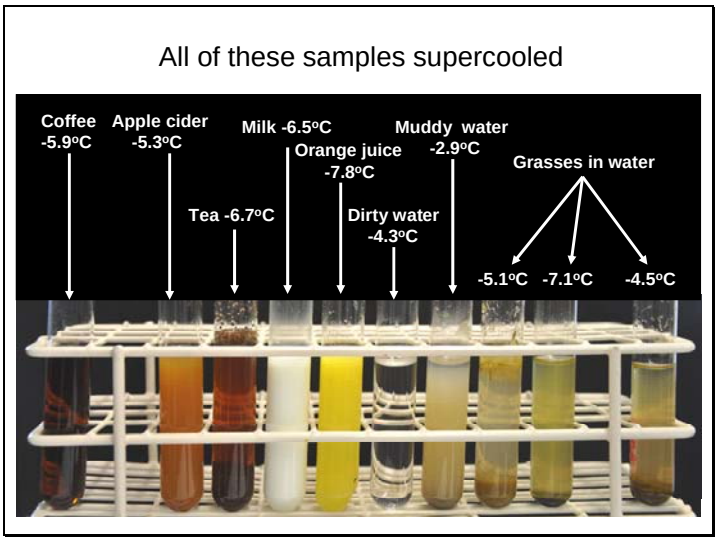
Supercooling and freezing dirty water: A laboratory investigation of terminally observable phenomena associated with cooling and freezing

James D. Brownridge
Department of Physics, Applied Physics, and Astronomy, State University of New York at Binghamton, P. O. Box 6000, Binghamton, New York 13902-6000, USA
E-mail jdbjdb@binghamton.edu

Water from any source can easily be supercooled or, prevented from supercooling. This is counter to the popular common belief that water must be clean if it is to be supercooled. We will show that when columns of dirty water are cooled from below to a supercooled state and held there for periods of minutes to days, (-15^{o}C for 422 days) some very interesting phenomena have been observed. I will discuss some of these phenomena. They include stable and unstable thermal oscillations, stable narrow vertical and circular convection cells, upside down convection; i.e. heat flowing down and electrical activity in the form of emf signals produced in the water when it first begins the freezing process, during freezing and also during thawing. The characteristics and duration of the electrical activity depends on the nature of the impurities in the water. Supercooling is crucial to observing many of these phenomena.



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