

Marks
5

- The freezing point of a sample of seawater is measured as $-2.15\text{ }^{\circ}\text{C}$ at 1 atm pressure. Assuming that the concentrations of other solutes are negligible, and that the salt does not significantly change the density of the water from 1.00 kg L^{-1} , determine the concentration (in mol L^{-1}) of NaCl in this sample. (The molal freezing point depression constant for H_2O is $1.86\text{ }^{\circ}\text{C m}^{-1}$)

Answer:

In principle, it would be possible to desalinate this water by pumping it into a cylindrical tower, and allowing gravity to push pure water through a semipermeable membrane at the bottom. At $25\text{ }^{\circ}\text{C}$, how high would the tower need to be for this to work? (The density of liquid Hg at $25\text{ }^{\circ}\text{C}$ is 13.53 g cm^{-3} .)

Answer: