10.213 Homework

Problem 25 Due 11/22

Ethylene glycol, $C_2H_4(OH)_2$, is commonly mixed with water and used as a permanent antifreeze in automobile engines. Assume that it mixes with water ideally. The density of water is 1.00 g/cm^3 and ethylene glycol is 1.11 g/cm^3. The heat of fusion for water is 6009.5 J/mol.

Plot the freezing point of the mixture (the initial formation of ice) as a function of the volume percent of ethylene glycol at 0, 20, 40, 60, and 80%.

For a 50/50 volume percent mixture of glycol and water, what is the temperature at which 7% of the water is converted to ice?