

2. Modern vehicles are designed to use an antifreeze solution in order to cool the engine while also lowering the freezing point of water to make sure no ice forms in cold temperatures. If 1.00 L of an aqueous solution contains 1.52 g of a nonelectrolyte compound used in antifreeze and the osmotic pressure of this solution at 20.0°C is 448 torr, calculate the molar mass of the antifreeze compound [8 pts]

The density of this antifreeze compound happens to be exactly the same as water. Assuming the normal  $K_f$  value of 1.86 °C/m for water, what would be the new freezing point temperature of the solution? [6pts]