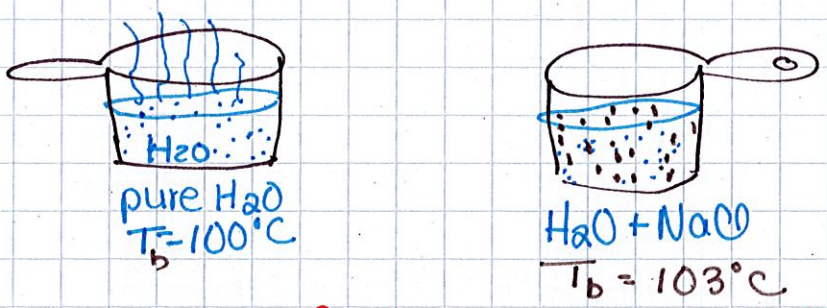
Colligative Properties of Solutions

a property that is dependent ONLY on the # particles in solution, NOT what they are made of.

1. Boiling Pt Elevation

- adding a solute to a pure solvent raises the boiling pt. temperature.

Why?



In order for the water to boil, it (molecules) have to gain more kinetic energy (higher boiling pt) in order to "push" past the solute (NaCl) & escape as a gas.

The more particles there are, the higher the boiling point.

$$\Delta T_b = K_b \cdot i \cdot m$$

- ΔT_b: change in the boiling pt.
- K_b: boiling pt. elevation constant
- i: van't Hoff factor: # particles in solution
- m: molality (a concentration)

van't Hoff factor (i) - refers to the solute

- for covalent molecules: $i = 1$
- for ionic compounds: i = # ions in the compound

ex NaCl $i = 2$ | $NaNO_3$ $i = 2$

MgF_2 $i = 3$ | $Fe_2(CO_3)_3$ $i = 5$