Freezing Point Depression

$\Delta T = T_{pure} - T_{soln} = i k_f (\text{molality})$

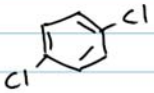
$i = 1$ when only one ionic species is present

(hint about answer to free response question regarding what assumption is made about the p-dichlorobenzene)

$$\text{molality} = \frac{(\text{mass solute}) / (\text{MW solute})}{\text{Mass (kg) solvent}}$$

↑ Yes, this is in kg!

Solvent = cyclohexane 

Solute = p-dichlorobenzene 

Pt I

- if you can't determine plateau from numbers, make yourself a T vs t plot

Pt II

- Calc ΔT → freezing point depression
- Calc molality → mol solute / kg solvent
  (Same eqn as above...)
- Calc k_f

$$k_f = \frac{\Delta T}{\text{molality}} = \frac{|(T_f \text{ Pure} - T_f \text{ mixture})|}{\text{molality}}$$

(You measured this in Pt I; Absolute value)

Pt III

- Still assuming $i = 1$
- calc ΔT & molality (think about the variables in the molality eqn)
  - k_f → you calculated this in pt II

you weighed this

find this

$$\frac{\Delta T}{k_f} = \frac{(\text{mass unknown}) / MW}{\text{mass (kg) Cyclohexane}}$$

you calculated this in pt II

$$MW = \frac{(\text{mass unknown})(k_f)}{(\text{mass (kg) cyclohexane})(\Delta T)}$$