5. You perform calorimetry experiments on an unknown material and obtain the following results:

For temperatures below 70 °C, you measure $C_p$ and $C_v$ and discover they are very similar to each other.

Above 70 °C you find that both $C_p$ and $C_v$ change and that $C_p$ is now larger than $C_v$.

There do not appear to be any chemical reactions.

a. (10pts) What could be happening at 70 °C that would account for these observations.

   **phase change, boiling, evaporation, vaporization**

b. *(5pts extra credit) You also notice that a significant amount of heat must be added to the system at a constant temperature of 70 °C before the temperature starts to rise again. You measure this amount of heat at constant pressure ($q_p$). What have you measured?

   $\Delta H_{vap}$, heat of vaporization