

Today we will talk about an irreversible processes.

You will be asked to write up your answer to this task (as well as a few more questions) on an upcoming homework.

What happens when I add an ice cube (at  $0^{\circ}\text{C}$ ) to a cup of water (at a given temperature) in an insulated container (but at constant pressure)? What is the final temperature? How much ice is left? What is the change in entropy of the ice? Of the water? What is the change in entropy?

You may use the following constants. The specific heat of liquid water is  $c_p = 4.18 \text{ J/g/K}$  and is roughly constant over this temperature range. The latent heat of fusion (a.k.a. the enthalpy of fusion) of ice is  $333 \text{ J/g}$ , which defines how much energy is required to melt ice.