

THERMODYNAMICS

Worksheet 1

DATA YOU MIGHT NEED:

$$C_{\text{ice}} = 2090 \text{ J / Kg / C}$$

$$C_{\text{water}} = 4187 \text{ J / Kg / C}$$

$$C (\text{milk}) = 3800 \text{ J / Kg / C}$$

$$h_f (\text{water}) = 3.35 \times 10^5 \text{ J / Kg}$$

$$h_v (\text{water}) = 2.26 \times 10^6 \text{ J / Kg}$$

1. Room temperature is often taken to be 68 F. What is this temperature in degrees celsius?
2. A pot of water on the stove increases temperature by 100 degrees celcius. What is this in kelvin? What is this in faranheit?
3. Why do white cars stay cooler in the summer time than black cars?
4. You touch two materials in the same room, and one of them feels warmer than the other. What can you conclude from this observation?
5. How much heat is needed to warm 3 kg of ice at -10 C to ice at -5 C?

6. How much heat is needed to raise the temperature of 3 kg of water at 4 C to water at 50 C?

7. How much heat is needed to change .5 kg of ice at 0 C to water at 5 C?

8. Suppose Ian mixes 10g of coffee (at 70 deg C) with 15 g of milk (10 deg C) (C=3800). What is the final temp? Assume that the specific heat capacity of coffee is the same as water.

9. Jack is trying to enjoy some hot cocoa but realizes his 0.6 kg of hot cocoa (mostly water) is a little too warm at 80 C. To cool it down, he puts in 0.1 kg of cool milk at 4 C. The specific heat of milk is 3800 J/ kg°C. What is the equilibrium temperature of the mixture?