

# Calorimetry

solara

November 19, 2024

Heat transfer: relation between mass, time and energy.

Heating a mass of water of 1 kg from 20°C to 30°C demands 1/2 less energy than would a mass of 2 kg from 20°C to 30°C ; and 1/2 less energy than needed to raise 1 kg from 20°C to 40°C.

We observe a double proportionality between energy, mass, & the difference in temperature  $\Delta T$ .

$$Q = Cm\Delta T$$

$$Q \text{ heat} = C [J/kg/^{\circ}C] * m [kg] * \Delta T [^{\circ}C]$$

$C$  is the coefficient of heat capacity. It's the quantity of heat needed to raise one kg of matter by 1°C. If the value of  $C$  is high, the material will need more energy to be heated. A high  $C$  characterizes a high resistance to temperature change. (thermal inertia)

To cool down 1 kg of water by 1°C, you have to subtract  $C$ .