

Ch 6 HW:RC; Sec 6.1 Written; Reinf Wks Sec 6.1
Sec 6.1A

obj: Explain the meaning of Specific Heat.

Heat

- A transfer of Thermal energy
 - * Work is a transfer of ME.
- Heat always flows from warm objects to cold objects.
 - * Heat flows from Hot to Cold.

- Insulators - materials which slow the transfer of Thermal Energy
 - * R-Value - Higher R-Value the better the insulator.

Heat Capacity

- The amount of Heat needed to change the temperature of an object.
- Heat Capacity depends on the object.
- Depends on the mass of the object.

Specific Heat

- The specific heat is the amount of energy needed to change a 1kg substance 1K. ($^{\circ}\text{C}$)
* Depends on the object but not on the mass.
- Specific Heat allows us to calculate the change in Thermal Energy

$$Q = m \Delta T C$$

Q = Heat or Change in Thermal Energy

m = mass of the object

C = Specific Heat of the Object

ΔT = Change in Temp.

$$\Delta T = T_f - T_i$$

* Specific Heat is a physical Property for the object.

How much Heat is needed to change 1kg of water 10K?

Known

$$m = 1 \text{ kg H}_2\text{O}$$

$$\Delta T = 10 \text{ K}$$

$$C = 4184 \text{ J/kgK}$$

Unknown

$$Q = ?$$

$$Q = m \Delta T C$$

$$= 1 \text{ kg} (10 \text{ K}) (4184 \text{ J/kgK})$$

$$= 41840 \text{ J}$$

- Energy cannot be created or destroyed.

* Conservation of Energy.

- The Heat Lost by the hot object is gained by the cold object.

$$Q_{\text{Lost}} = Q_{\text{gained}}$$

Conservation of Energy!