# Warm Up

Determine the enthalpy change associated with converting 250. g of water to ice at 0.0 °C.

$H_{solid} = -H_{fus}$

$\Delta H_{solid} = ?$

$m = 250.g$

$H_2O$

$$\Delta H_{solid} = n H_{solid}$$

$$\Delta H_{solid} = \left(\frac{250.g}{18.02 g/mol}\right)\left(-6.03 \frac{kJ}{mol}\right)$$

$$\Delta H_{solid} = -83.7\ kJ$$

# Homework - Worksheet

## Heat (q)

- change in kinetic energy
- measures transfer of energy when there are temperature changes (heating or cooling)

## Enthalpy (H)

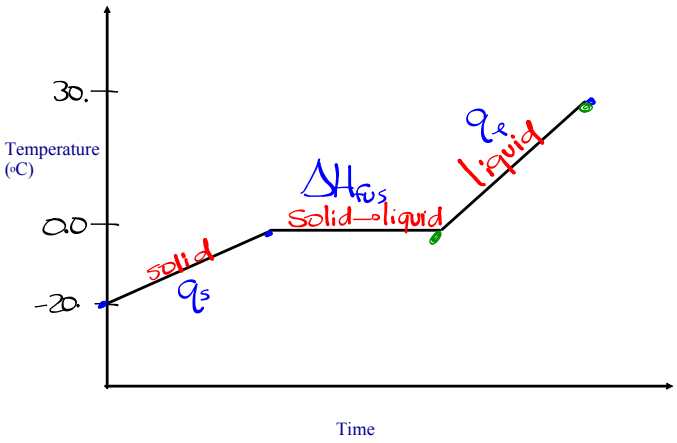
- measures potential energy
- change in energy transfer when system is at constant pressure and same initial and final temperatures

What we've looked at so far...

- Energy changes when the temperature changes
  (heating water from 20 °C to 50°C)
- Energy changes when the temperature remains the same.
  (melting of ice at 0°C)

**What if you heat 10. g of ice at -20. °C until it is water at 30.°C?**

## Heating Curve of Water




$\Delta E_T = q_s + \Delta H_{fus} + q_e$

$q_s = mC\Delta T$

$q_s = (10.g)(2.01\frac{J}{g\cdot°C})(20.°C)$

$q_s = 402\ J$

$\Delta H_{fus} = nH_{fus}$

$\Delta H_{fus} = \left(\frac{10.g}{18.02g/mol}\right)\left(6.03\frac{kJ}{mol}\right)$

$\Delta H_{fus} = 3.3463\ kJ$

$q_e = mC\Delta T$

$q_e = (10.g)(4.19\frac{J}{g\cdot°C})(30.°C)$

$q_e = 1257\ J$

$\Delta E_T = q_s + \Delta H_{fus} + q_e$

$\Delta E_T = (402J) + (3346J) + (1257J)$

$\Delta E_T = 5005\ J$

$= \boxed{5.0\ kJ}$