

**Answer on Question #72685, Chemistry / General Chemistry :**

The specific heat of iron is  $0.449 \text{ Jg} \cdot \text{C}^\circ$ . Suppose you have a 2.000-lb block of iron at  $51.0^\circ\text{C}$ . How much heat in joules would it take to warm this block to  $74.0^\circ\text{C}$ ?

**Solution.**

$$c = 0.449 \text{ J} / \text{g} \cdot ^\circ\text{C}$$

$$m = 2.000 \text{ lb}$$

$$t_1 = 51.0^\circ\text{C}$$

$$t_2 = 74.0^\circ\text{C}$$

$$Q = ?$$

We have a 2.000-lb block of iron:

$$1 \text{ lb} = 453.592 \text{ g}$$

$$2 \text{ lb} = 907.185 \text{ g}$$

To calculate the amount of heat, we can write the formula:

$$Q = c \cdot m \cdot \Delta t = c \cdot m \cdot (t_2 - t_1)$$

And:

$$Q = c \cdot m \cdot (t_2 - t_1)$$

$$Q = 0.449 \text{ J} / \text{g} \cdot ^\circ\text{C} \cdot 907.185 \text{ g} \cdot (74.0^\circ\text{C} - 51.0^\circ\text{C})$$

$$Q = 9368.499 \text{ J} \approx 9368.5 \text{ J}$$

**Answer:**  $Q = 9368.5 \text{ J}$