Answer on Question#76983 – Chemistry – General chemistry

Question: In order to cook an omelet, a 5.00 kg iron skillet must be heated from room temperature (25.0°C) to 150.0°C. How many Joules of heat must be used to accomplish this? The specific heat capacity of iron is 0.4521 J/g°C.

Solution:

1. Convert kg to g:

$5.00 \text{ kg} = 5.00 \times 10^3 \text{ g}$

2. Find temperature difference:

$\Delta T = 150°C - 25°C = 125°C$

3. Find the heat:

$Q = cm\Delta T = 0.4521 \dfrac{J}{g°C} \times 5.00 \times 10^3 g \times 125°C = 2.83 \times 10^3 \text{ J}$

Answer:

$2.83 \times 10^3 \text{ J}$