Answer on Question #78237, Chemistry / General Chemistry

Question:

A 0.500 kg mass of unknown metal at 100.0 °C is placed in 120.0 g H_2O at 25.0 °C. The final temperature of the water and metal is 30.0 °C. Ignoring the container, what is the specific heat of the metal? (c-water = 4.184 J/g°C)

A. 0.0071 J/g°C

B. 0.0142 J/g°C

C. 0.071 J/g°C

D. 0.142 J/g°C

E. None of the Above

Solution:

Energy absorbed by water: $Q = c \cdot m \cdot \Delta T = 4.184 \cdot 120 \cdot (30.0 - 25.0) = 2510.4$ J

The metal lost the same energy.

Specific heat of the metal: $c = Q / (m \cdot \Delta T) = 2510.4 / (500 \cdot (100.0 - 30.0)) = 0.071$ J/g°C

Answer:

C. 0.071 J/g°C