Question #47258, Chemistry, Other

A calorimeter is filled with 125 g of water. The temp of water is 22.3 C. A 50g chunk of metal at 123 C is dropped into the calorimeter and temp increases to 24.5 C. What is the specific heat of the metal? You can ignore the heat absorbed by the calorimeter.

Answer

Amount of heat is transferred to water:

$$Q_1 = m_w * c_w * \Delta t = 0.125 * 4200 * 2.2 = 1155J$$

Amount of heat is lost by metal:

$$Q_1 = m_m * c_m * \Delta t_2 = m_w * c_w * \Delta t_1$$

Specific heat of metal is equal:

$$c_w = \frac{m_w * c_w * \Delta t}{m_m * \Delta t_2} = \frac{1155}{0.05 * 98.5} = 234.5\ J/kg * K$$