Answer on Question #49859, Chemistry, Other

Task:

A 55 g sample of water at 80 degrees celcius is added to a sample of water at 25.5 degrees celcius in a constant pressure calorimeter. If the final temperature of the combined water is 39.4 degrees celcius calculate the mass of water originally in the calorimeter.

Answer:

$$Q = cm\Delta T$$

$$c_1 m_1 \Delta T_1 = c_2 m_2 \Delta T_2$$

$$c(H_2O) = 4{,}182 \frac{kJ}{kg \cdot {}^{o}C}$$

$$4{,}182 \cdot 55 \cdot (80 - 39{,}4) = 4{,}182 \cdot m_2 (39{,}4 - 25{,}5)$$

$$m_2 = \frac{55 \cdot (80 - 39{,}4)}{(39{,}4 - 25{,}5)} = 160{,}6\, g$$