**Regents Chemistry – Calorimetry Practice**

1. If the temperature of 34.4 g ethanol increases from 25.0 °C to 78.8°C, how much heat was absorbed the ethanol? ($C_p$ ethanol = 2.44 J/g°C)

2. A 155 g sample of an unknown substance was heated from 25.0 °C to 40.0 °C by absorbing 5696 J of energy. What is the specific heat of the substance?

3. A piece of aluminum absorbs 345 J when heated from 298 K to 368 K. What is the mass of the aluminum? ($C_p$ aluminum = 0.9025 J/gK)

4. A piece of aluminum is heated to 87.5 °C and placed into a Styrofoam cup calorimeter containing 350. g of water at an initial temperature of 23.0 °C. The final temperature of the aluminum and water is 24.8°C. How much heat was released by the aluminum?

5. A piece of gold is heated to 65.4°C and placed in a calorimeter containing 160. g of water at 25.5°C. The final temperature of the metal and water is 27.8°C. How much energy was released by the gold?

Key

**Regents Chemistry – Calorimetry Practice**

1. If the temperature of 34.4 g ethanol increases from 25.0 °C to 78.8°C, how much heat was absorbed the ethanol? ($C_p$ ethanol = 2.44 J/g°C)

$q = mc\Delta T$

$x = (34.4g)(2.44\ J/g°C)(78.8-25.0°C)$

$x = (34.4g)(2.44\ J/g°C)(53.8°C)$

$x = 4515.7568\ J \rightarrow$ **4520J**

2. A 155 g sample of an unknown substance was heated from 25.0 °C to 40.0 °C by absorbing 5696 J of energy. What is the specific heat of the substance?

$q = mc\Delta T$

$5696\ J = (155g)(x)(40.0-25.0°C)$

$5696\ J = (155g)(x)(15°C)$

$\frac{5696\ J}{2325\ g°C} = \frac{(2325\ g°C)(x)}{2325}$

**$x = 2.45\ J/g°C$**

3. A piece of aluminum absorbs 345 J when heated from 298 K to 368 K. What is the mass of the aluminum? ($C_p$ aluminum = 0.9025 J/gK)

$q = mc\Delta T$

$345\ J = (x)(.9025\ J/g°C)(368-298K)$

$345\ J = (x)(.9025\ J/g°C)(70K)$

$\frac{345\ J}{63.175\ J/g} = \frac{(63.175\ J/g)(x)}{63.175}$

$x = 5.4610209$

**$x = 5.46g$**

4. A piece of aluminum is heated to ~~87.5~~ °C and placed into a Styrofoam cup calorimeter containing 350. g of water at an initial temperature of 23.0 °C. The final temperature of the aluminum and water is 24.8°C. How much heat was released by the aluminum?

$q = mc\Delta T$

$x = (350.g)(4.18\ J/g°C)(24.8-23.0°C)$

$(350.g)(4.18\ J/g°C)(1.8°C)$

$x = 2633.4\ J$

**2630J**

5. A piece of gold is heated to ~~65.4°C~~ and placed in a calorimeter containing 160. g of water at 25.5°C. The final temperature of the metal and water is 27.8°C. How much energy was released by the gold?

$(160.g)(4.18\ J/g°C)(27.8-25.5°C)$

$(160.g)(4.18\ J/g°C)(2.3°C)$

$x = 1538.24\ J \Rightarrow$ **1540J**