ROQED PHYSICS LAB

Comparison of the amount of heat when mixing water of different temperatures

Purpose of work: Calculate the amount of heat required for heating a body or released by it during cooling, make sure they are equal.
Equipment: calorimeter, measuring cylinder (beaker), thermometer, glass.

Theoretical part

To calculate the amount of heat required for heating a body or released by it during cooling, the specific heat capacity should be multiplied by the mass of the body and by the difference between the final and initial temperatures $Q = cm\ (t_2 - t_1)$

If heat exchange occurs between the bodies, then the internal energy of all heating bodies increases as much as the internal energy of cooling bodies decreases.

The amount of heat given off by hot water and the amount of heat received by cold water are equal to each other.

In practice, when conducting experiments, it usually turns out that the energy given off by hot water is greater than the energy received by cold water. This is because part of the energy is transferred to the surrounding air, and part of the energy is transferred to the vessel in which the water was mixed. The equality of the given and received energy will be the more accurate, the less energy losses are allowed in the experiment.

Work progress:

1. Assemble the installation shown on the board....

2. Run the simulation

3. Pour the hot water in the calorimeter of 100 g ($m_{1),}$and in the glass - the same cold (m2).

4. Measure the temperature of cold (t_1) and hot water (t_2). Enter the data into the table.

5. Pour cold water into a container of hot water. Measure the temperature of the mixture (t_3) and enter the data in the Table.

6. Make a formula to calculate the amount of heat given off by hot water when it cools down to the temperature of the mixture.
$Q_1 = s \cdot m \cdot (t_2-t_3)$

7. Make a formula to calculate the amount of heat received by cold water when heated to the temperature of the mixture.
$Q_2 = s \cdot m \cdot (t_3-t_1)$

8.Table

m_1 (kg)	m_2, kg	t_1 (° C)	t_2 (° C)	t_3, (° C)	Q_1 (J)	Q_2, (J)
0.1	0.1	...	...	...		

9. Make a conclusion:
A. The amount of heat given off by hot water and the amount of heat received by cold water are equal to each other.
In. The energy given off by hot water is greater than the energy received by cold water, since the internal energy of hot water is greater.
C. The energy given off by hot water is less than the energy received by cold water, since the internal energy of hot water is less.