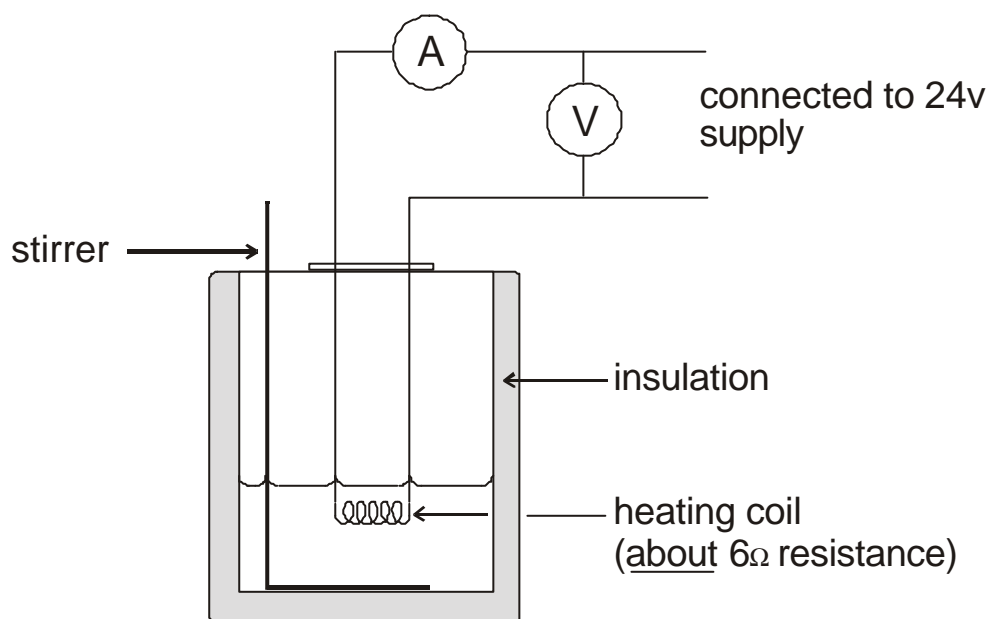


## Experiment to measure the Specific Heat Capacity of Water

1. **Preparation:**
- Learn the definition of specific heat capacity.
  - Revise electrical power and energy.
  - Write a list of all the results you will need to take during the experiment. It is a good idea to try to write the list in the order that you will take the results.
  - Derive an equation from which the specific heat capacity of water can be calculated.
  - See part 3 below.
2. The diagram below shows an insulated “calorimeter” suitable for use in experiments of this type. A calorimeter is simply an aluminium container for the water, with an aluminium stirrer.



Measure the quantity of heat needed to produce a measured temperature change in a known mass of water. Use the ammeter and voltmeter (together with a stop-watch) to find the quantity of electrical energy put into the heater.

- a) An electric heater is 100% efficient. This means that the quantity of heat energy given out is equal to the electrical energy put in.
- b) As you heat the water you are, of course, also heating the aluminium. Al is a very good conductor so we can assume that at all times during the experiment, the Al has the same temperature as the water.
- c) Specific heat capacity of aluminium =  $908 \text{ Jkg}^{-1}\text{°C}^{-1}$

Do the experiment as many times as you can in the time available using different masses of water.

3. The temperature changes involved should not be *less than* (about)  $10\text{°C}$  but not *more than* (about)  $30\text{°C}$ . Why are there these limitations ?