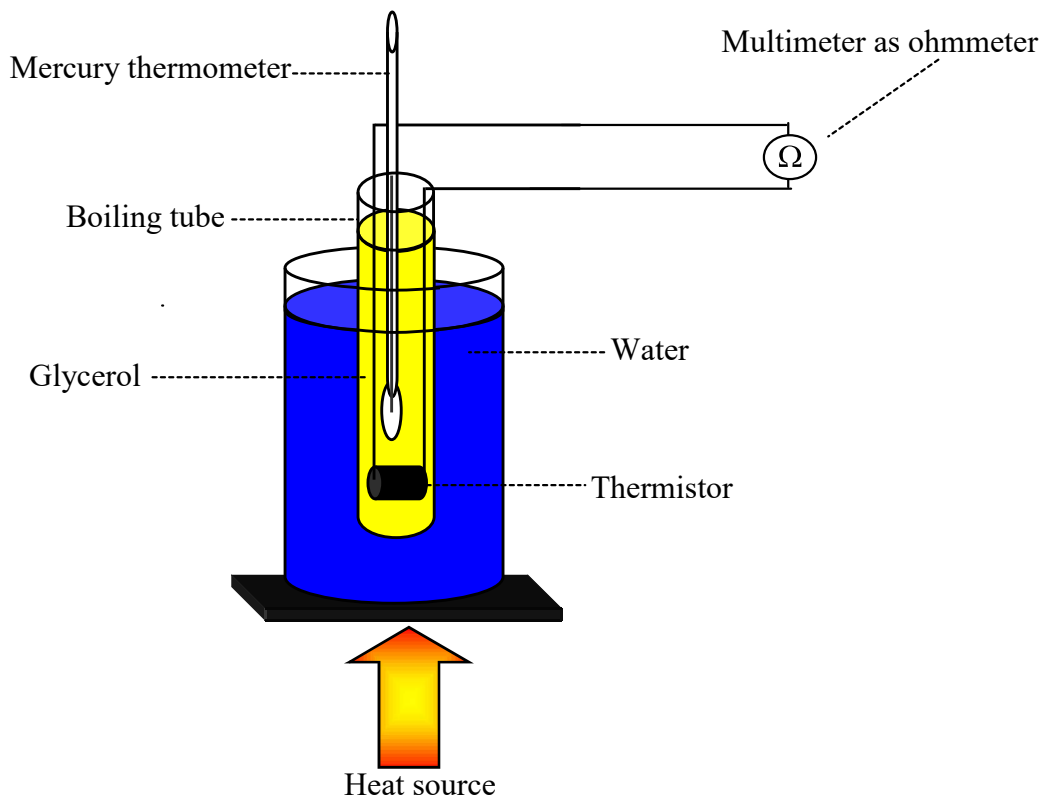


CALIBRATION CURVE OF A THERMOMETER USING THE LABORATORY MERCURY THERMOMETER AS A STANDARD

Apparatus

Mercury thermometer, thermistor or any other thermometer to be calibrated, boiling tube containing glycerol, heat source, beaker of water, ohmmeter/multimeter.



Procedure

1. Set up apparatus as shown in the diagram.
2. Place the mercury thermometer and the thermistor in the boiling tube.
3. Record the temperature θ , in $^{\circ}\text{C}$, from the mercury thermometer and the corresponding thermistor resistance R , in ohms, from the ohmmeter.
4. Increase the temperature of the glycerol by about 5°C .
5. Again record the temperature and the corresponding thermistor resistance.
6. Repeat the procedure until at least ten sets of readings have been recorded.
7. Plot a graph of resistance R against temperature θ and join the points in a smooth, continuous curve.

Results

$\theta/^\circ\text{C}$	R/Ω

Notes

The resistance of the leads has been ignored in the description above, since it is negligible.

There is very good thermal contact between the glycerol and the thermistor since the glycerol does not contain dissolved gases.

The boiling tube of glycerol is placed in a water bath to limit the maximum temperature reached to 100 °C.

The thermistor can now be used to measure temperatures within the range for which it has been calibrated. Place the thermistor in thermal contact with the body whose temperature is to be found. Measure the resistance and find the corresponding temperature from the calibration curve.