

Question 12(b).

Explain the term thermometric property.

Describe how you would carry out an experiment to draw a calibration curve of a thermometer using the laboratory mercury in glass thermometer as standard.

Explain why it is necessary to have a standard thermometer.

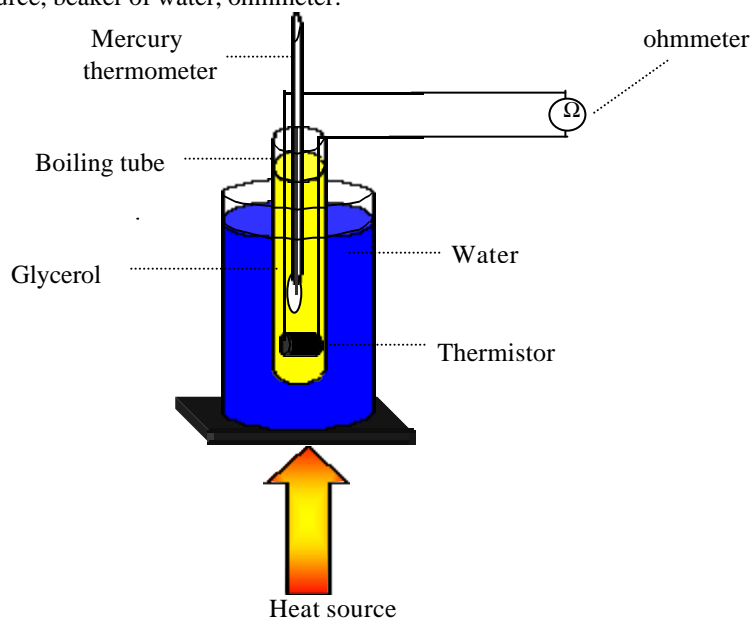
Explain the term thermometric property

It is some physical property of matter that varies with temperature, and consequently may be used to measure temperature.

Describe how you would carry out an experiment to draw a calibration curve of a thermometer using the laboratory mercury in glass as standard.

Apparatus

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



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. This is the calibration curve

Explain why it is necessary to have a standard thermometer

Thermometers based on different thermometric properties give different values for the same temperature except at those fixed-point temperatures that, by definition, they agree. Each thermometer is right according to its own scale. To enable accurate communication between scientists it is necessary that one thermometer is agreed as the standard.