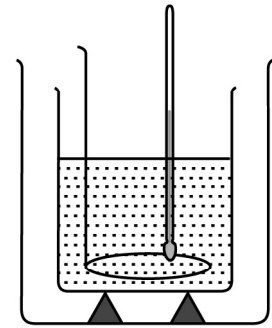


Diagram shows an experimental setup in the laboratory to find out the specific heat capacity of a liquid using cooling method. The liquid is present inside the calorimeter kept on insulating wedges which is kept inside a large vessel.

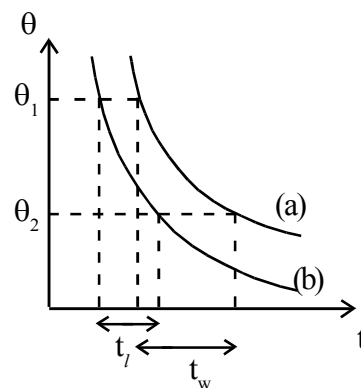


(a) Write three factors which determine the total rate of loss of heat of the liquid and calorimeter.

(b) State the Newton's law of cooling and instances where it can be applied.

(c) Usually, equal volumes of liquid and water are used in this experiment. Explain the reason for using equal volumes.

Diagram shows the curves of cooling relevant for water (curve a) and for the liquid (curve b) taken in this experiment.



(d) Heat capacity of the calorimeter is C and specific heat capacity of liquid and water are S_l and S_w respectively. Masses of liquid and water are m_l and m_w respectively.

(i) What is the mean value of the rate of loss of heat of liquid and calorimeter from θ_1 to θ_2 ?

(ii) What is the mean value of the rate of loss of heat of water and calorimeter from θ_1 to θ_2 ?

(iii) Write the relationship between the expressions obtained from (i). and (ii).

(e) A beaker is not suitable in this experiment to replace a calorimeter. Explain the reason.