

PQ 4 Questions

Q1

Hypothermia can occur if the body temperature drops to 35.0°C , although people have been known to survive much lower temperatures. On January 19, 1985, 2-year-old Michael Trode was found in the snow near his Milwaukee home with a body temperature of 16.0°C . If Michael's mass was 10.0 kg , how much heat did his body lose, assuming his normal body temperature was 37.0°C ? ($c_{\text{human body}} = 3470\text{ J/kg}^{\circ}\text{C}$)

Q2

Gwyn's bowl is filled with 0.175 kg of 60.0°C soup (mostly water) that she stirs with a 20.0°C silver spoon of mass 0.0400 kg. The spoon slips out of her hand and slides into the soup. What equilibrium temperature will be reached if the spoon is allowed to remain in the soup and no heat is lost to the outside air? ($c_{\text{spoon}} = 240. \text{ J/kg}^\circ\text{C}$) Assume that the temperature of the bowl does not change.

Q3

An igloo is made of 224 blocks of ice at 0°C , each with a mass of 12.0 kg. How much heat must be gained by the ice to melt the entire igloo?

Q4

Gus is cooking soup in his hot pot and finds that he has added too much water. If Gus needs to boil off 0.200 kg of water in order for his soup to have the correct consistency, how much additional heat must Gus add once the soup is boiling?

Q5

To cool her 0.200-kg cup of 75.0°C hot chocolate (mostly water), Heidi drops a 0.0300-kg ice cube at 0°C into her insulated foam cup. What is the temperature of the hot chocolate after all the ice is melted?