1. Textbook - Page 319 : 1-6

2. Textbook - 323: 31; 324: 32-36; 325:37-40

3. Determine the amount of heat required to convert 0.03 kg of ice at $-15°F$ to steam at $280°F$. The specific heat of ice is 2090 $J/kg°C$, the specific heat of water is 4186 $J/kg°C$, the specific heat of steam is 2010 $J/kg°C$. The latent heat of fusion for water is 3.33×10^5 $J/kg°C$, the latent heat of vaporization is 2.26×10^6 $J/kg°C$.

4. Determine the amount of energy required to evaporate 0.5 kg block of aluminum at $20°C$. Melting point of aluminum is 660.4 $°C$. The specific heat of solid aluminum is 900 $J/kg°C$ and its latent heat of fusion is 3.97×10^5 J/kg.

5. A 0.04 kg block of ice at $-15°F$ is added to 1.2 kg water at $150°F$. Determine the equilibrium temperature reached by the mixture.

6. An aluminum rod of length 1.2 m at $20°C$ is heated to 100 $°C$. Determine the percentage change in the length of the rod. The coefficient of linear expansion of aluminum is 24×10^{-6} $/°C$.

7. An iron rod of length 0.8 m at -10 ° is heated. Determine the temperature at which its length is 0.801 m. $\alpha_{iron} = 11 \times 10^{-6}$ °.

8. A aluminum sphere of radius 10 cm at 24 $°F$ is heated to 200 $°F$. Determine the change in its volume. $\alpha_{aluminum} = 24 \times 10^{-6}$ $/°C$.

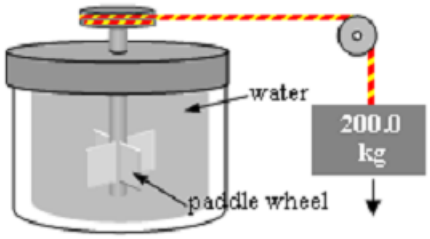
9. A steel gas tank of volume 0.0700 m^3 is filled to the top with gasoline at 20.0 $°C$. The tank is placed inside a chamber with an interior temperature of 50.0 $°C$. The coefficient of volume expansion for gasoline is 9.50×10^{-4} $/C°$; and the coefficient of linear expansion of steel is 11.0×10^{-6} $/C°$. After the tank and its contents reach thermal equilibrium with the interior of the chamber, how much gasoline has spilled?

10. The coefficient of volumetric expansion for gold is 4.20×10^{-5} $/C°$. The density of gold is 19300 kg/m^3 at 0.0 $°C$. What is the density of gold at 1050 $°C$? (Hint: Assume a volume of 1 m^3 at 0 $°C$.

11. Two spheres, labeled A and B, have identical masses, but are made of different substances. The specific heat capacity of sphere A is 440 $J/(kg\,^circC)$ and that of sphere B is 160 $J/(kg \circ C)$. The spheres are initially at 21 $°C$; and the same quantity of heat is added to each sphere. If the final temperature of sphere A is 72 $°C$, what is the final temperature of sphere B?

12. A 2.00 kg metal object requires 5.02×10^3 J of heat to raise its temperature from 20.0 $°C$ to 40.0 $°C$. What is the specific heat capacity of the metal?

13. A 200.0 kg object is attached via an ideal pulley system to paddle wheels that are submerged in 0.480 kg of water at 20.0 $^/circC$ in an insulated container as shown in the drawing. Then, the object falls through a distance of 5.00 m causing the paddle wheel to turn. Assuming all of the mechanical energy lost by the falling object goes into the water, determine the final temperature of the water.



14. A 0.20 kg lead ball is heated to 90.0 $°C$ and dropped into an ideal calorimeter containing 0.50 kg of water initially at 20.0 $°C$. What is the final equilibrium temperature of the lead ball? The specific heat capacity of lead is 128 $J/(kg\,C°)$; and the specific heat of water is 4186 $J/(kg\,C°)$.

15. A gold sphere has a radius of 1.000 cm at 25.0 $°C$. If 7650 J of heat is added to the sphere, what will the final volume of the sphere be? Gold has a density of 19300 kg/m^3 at 25.0 $°C$, a specific heat capacity of 129 $J/(kgC°)$, and a coefficient of volume expansion of 42.0×10^{-6} $/C°$.

16. Judy places 0.150 kg of boiling water in a thermos bottle. How many kilograms of ice at 12.0 $°C$ must Judy add to the thermos so that the equilibrium temperature of the water is 75.0 $°C$?