

## Energy

Determine the amount of energy absorbed or released in each of the following changes.

1. 40.0 g of water heated from 10.0°C to 30.0°C. 3,340 J
2. 25.0 g of water cooled from 85°C to 40°C. 4,720 J
3. 65.0 g of water heated from 32.5°C to 48.7°C. 4,430 J
4. 135.6 g of water cooled from 95.8°C to 21.6°C. 42,200 J
5. 100.0 g of ice melted with no temperature change. 33,360 J
6. 40.0 g of water boiled at 100.0°C. 90,300 J
7. 30.0 g of aluminum heated from 15.0°C to 35.0°C. 539 J
8. 450.0 g of iron cooled from 125.0°C to 45.0°C. 16,600 J
9. 62.3 g of lead heated from 21.7°C to 136.4°C. 928 J
10. 195.4 g of magnesium cooled from 120.6°C to 14.9°C. 21,980 J
11. 1.5 kg of copper heated from 5.5°C to 132.0°C. 75,000 J
12. 47.8 g of lead melted with no change in temperature. 1,180 J
13. 186.3 g of copper changed from liquid to solid state at its melting point. 38,160 J
14. The complete vaporization of 53.8 g of lead at its boiling point. 51,000 J
15. The condensation from vapor to liquid state of 235.5 g of copper at its boiling point.  $1.250 \times 10^6$  J
16. The heating of a mixture of 5.8 g of lead and 6.2 g of copper from 5.8°C to 12.1°C. 20 J
17. How much energy does it take to convert 400.0 g of ice at  $-25^\circ\text{C}$  to steam at  $275^\circ\text{C}$ ?  $1.37 \times 10^6$  J
18. What is the final temperature when 750 J of energy is added to 9.0 g of ice at  $0.0^\circ\text{C}$ ?  $0.0^\circ\text{C}$
19. How much energy is required to change the temperature of 45.0 g of Cesium at  $24.0^\circ\text{C}$  to  $880.0^\circ\text{C}$ ?  
32,000 J
20. An ice cube at  $0.0^\circ\text{C}$  is heated until it melts and the water temperature is  $20.0^\circ\text{C}$ . The amount of heat required for this is  $5.000 \times 10^3$  J. What is the mass of the ice cube? 12.0 g