Exercises

18. How much heat is required to raise the temperature of 854 g H_2O from 23.5°C to 85.0°C?
19. Phosphorus trichloride, PCl_3, is a compound that is important in the manufacture of pesticides and gasoline additives. How much heat is required to raise the temperature of 96.7 g PCl_3 from 31.7°C to 69.2°C? The specific heat of PCl_3 is 0.874 J/g·C°.
20. Carbon tetrachloride, CCl_4, was a very popular organic solvent until it was found to cause cancer. How much heat is required to raise the temperature of 10.35 g CCl_4 from 32.1°C to 56.4°C? (See Table A-5 of the Appendix.) .85651 J/g·C
21. If a piece of aluminum with mass 3.90 g and a temperature of 99.3°C is dropped into 10.0 cm^3 of water at 22.6°C, what will be the final temperature of the system? (Recall the density of water is 1.00 g/cm^3.)
22. The color of many ceramic glazes comes from cadmium compounds. If a piece of cadmium with mass 65.6 g and a temperature of 100.0°C is dropped into 25.0 cm^3 of water at 23.0°C, what will be the final temperature of the system?
23. A piece of an unknown metal with mass 23.8 g is heated to 100.0°C and dropped into 50.0 cm^3 of water at 24.0°C. The final temperature of the system is 32.5°C. What is the specific heat of the metal?