3. An aluminum wire having a cross-sectional area equal to 4.00×10^{-6} m² carries a current of 5.00 A. The density of aluminum is 2.70 g/cm³. Assume each aluminum atom supplies one conduction electron per atom. Find the drift speed of the electrons in the wire.

14. A 0.900-V potential difference is maintained across a 1.50-m length of tungsten wire that has a cross-sectional area of 0.600 mm². What is the current in the wire?

18. Aluminum and copper wires of equal length are found to have the same resistance. What is the ratio of their radii?

25. **M** An aluminum wire with a diameter of 0.100 mm has a uniform electric field of 0.200 V/m imposed along its entire length. The temperature of the wire is 50.0°C. Assume one free electron per atom. (a) Use the information in Table 27.2 to determine the resistivity of aluminum at this temperature. (b) What is the current density in the wire? (c) What is the total current in the wire? (d) What is the drift speed of the conduction electrons? (e) What potential difference must exist between the ends of a 2.00-m length of the wire to produce the stated electric field?