

SECTION 2

OBJECTIVES

- Describe the operation of voltaic cells, including dry cells, lead-acid batteries, and fuel cells.
- Identify conditions that lead to corrosion and ways to prevent it.
- Describe the relationship between voltage and the movement of electrons.
- Calculate cell voltage/potentials from a table of standard electrode potentials.

Voltaic Cells

Voltaic cells use spontaneous oxidation-reduction reactions to convert chemical energy into electrical energy. Voltaic cells are also called *galvanic cells*. The most common application of voltaic cells is in batteries.

How Voltaic Cells Work

Figure 4 shows an example of a voltaic cell: the $\text{Zn}||\text{Cu}$ electrochemical cell discussed in the previous section.

Electrons given up at the anode pass along the external connecting wire to the cathode. The movement of electrons through the wire must be balanced by the movement of ions in the solution. Thus, in **Figure 4**, sulfate ions in the CuSO_4 solution can move through the barrier into the ZnSO_4 solution.

