Electrolytic Cells
Extra Exercises
Section 14.3

1. Write the equations for the anode, cathode, and net reactions for the electrolysis of molten aluminium oxide. One half-reaction will involve conversion of liquid oxide ions into oxygen gas.

2. Write equations for the anode, cathode, and net reactions for the electrolysis of molten potassium bromide.

3. For the following electrolytic cells, write equations for half-reactions and the net cell reaction, and calculate the minimum electrical potential difference that would be required to cause the electrolysis to occur.

    (a) an aqueous solution of nickel (II) chloride is electrolyzed

    (b) an aqueous solution of potassium sulfate is electrolyzed

    (c) an aqueous solution of lead (II) nitrate is electrolyzed

Stoichiometry of Cell Reactions
Extra Exercises
Section 14.4

1. A student wishes to set up an electrolytic cell to plate copper onto a belt buckle. Predict the length of time it will take to plate out 2.5 g of copper from a copper(II) nitrate solution using a 2.5 A current. At which electrode should the buckle be attached?

2. Determine the mass of chlorine produced when a 200 A current flows for 24.0 h through a cell containing molten sodium chloride (a Downs cell). At which electrode is the chlorine produced?

3. How long would it take a 500 A current to produce 1.00 kg of aluminium from aluminium oxide dissolved in molten cryolite (Hall–Héroult cell)?

4. A trophy company is setting up a nickel-plating cell using an electrolyte containing nickel(II) ions. Predict the current required to produce nickel metal at the rate of 5.00 g/min.