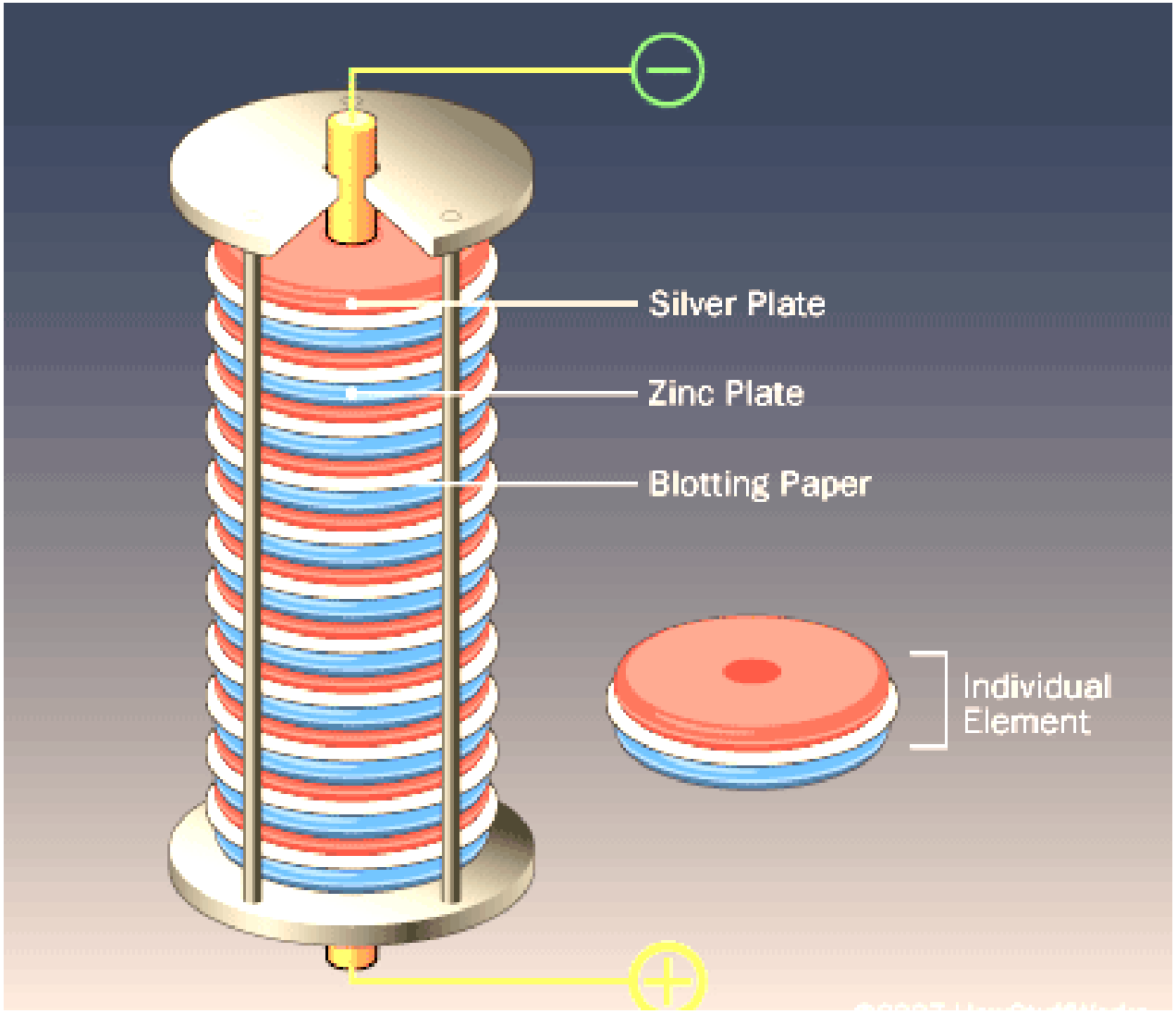
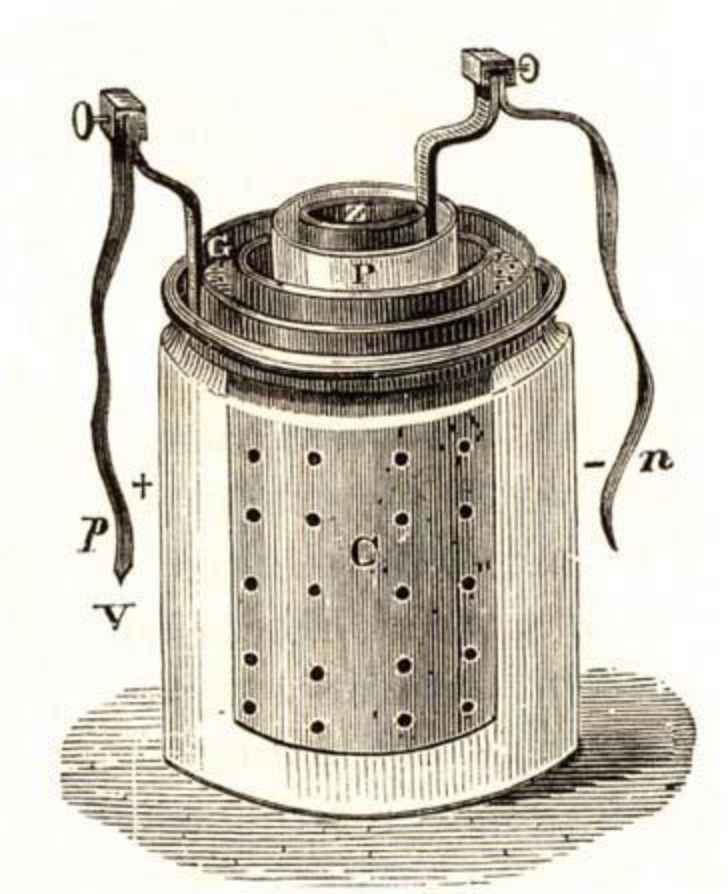
BATTERIES

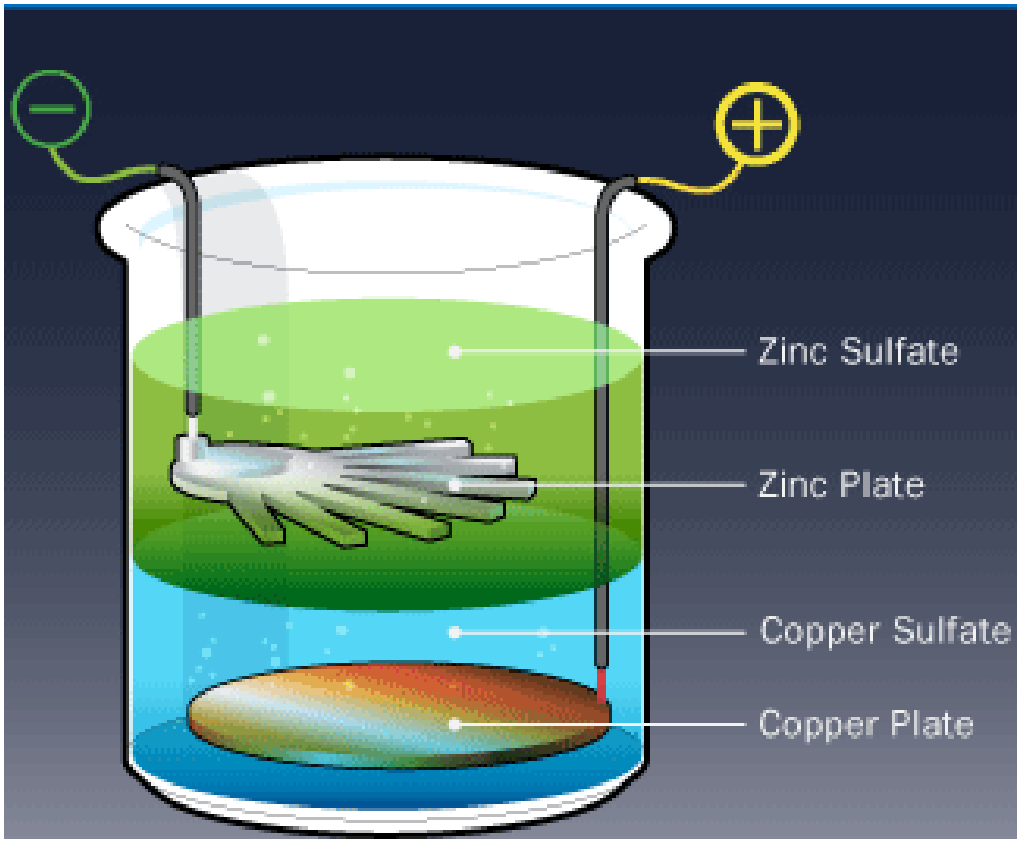
Baghdad Battery

VOLTAIC PILE

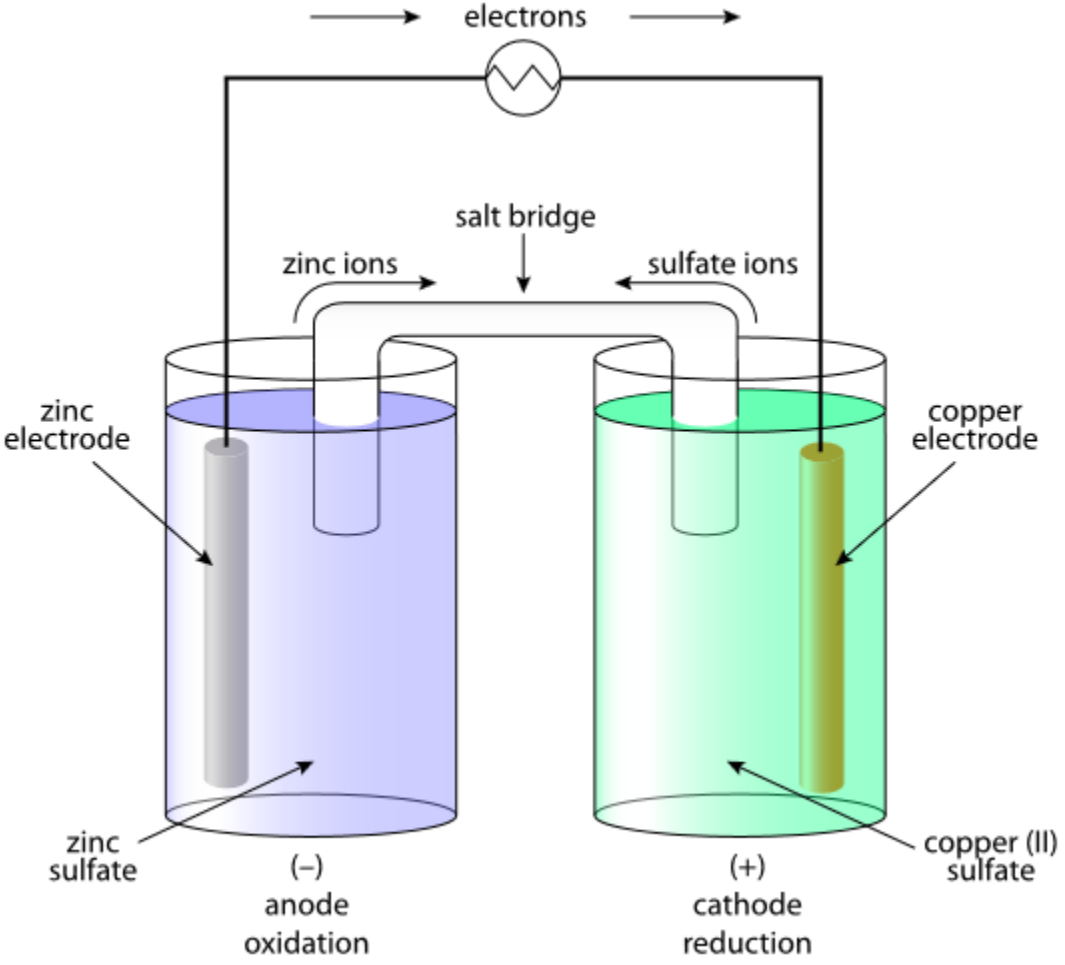


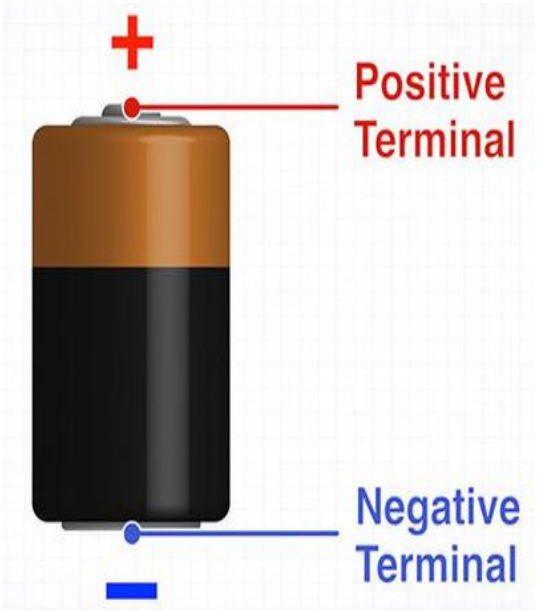
DANIELL CELL





DANIEL/GALVANIC CELL

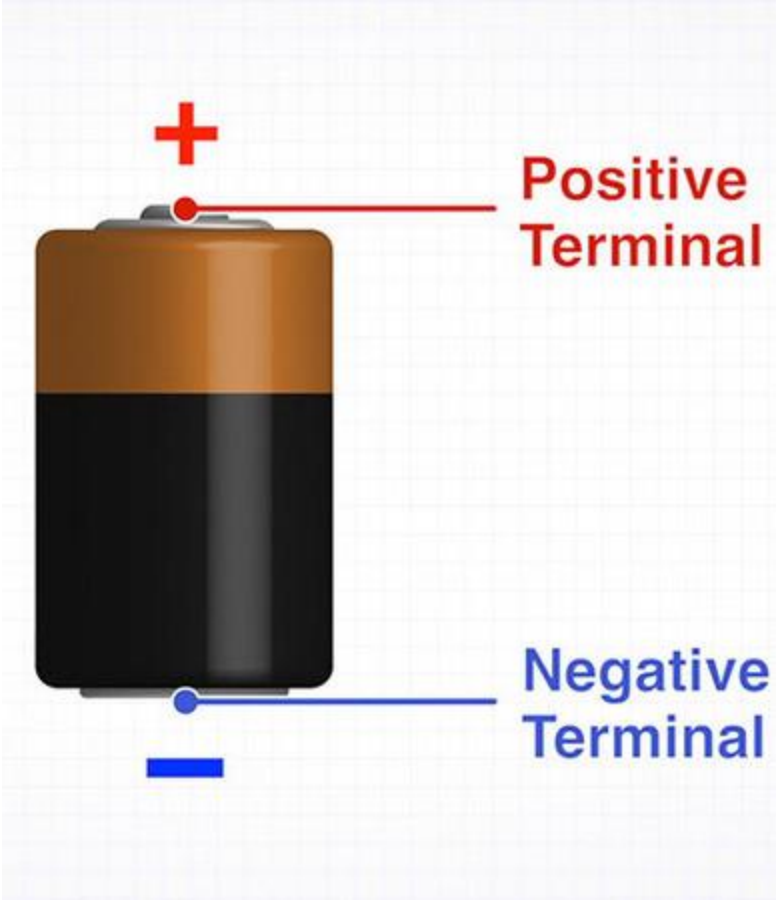



Positive
Terminal
Negative
Terminal

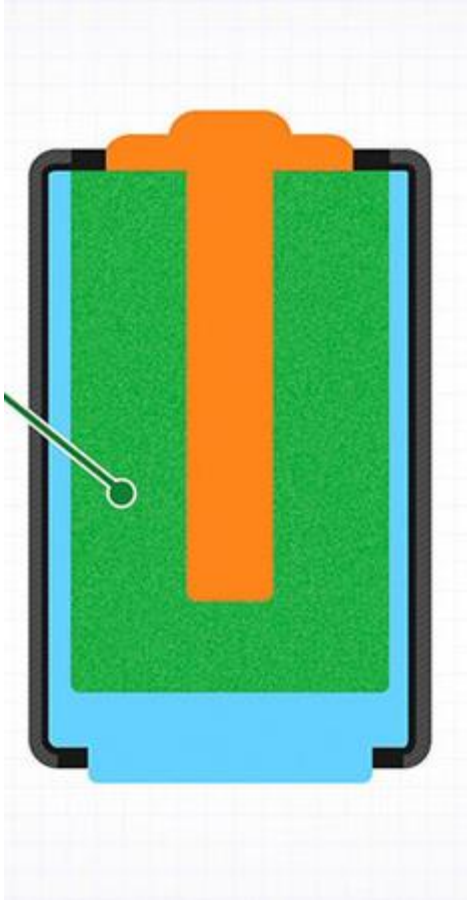

Energizer
RECHARGEABLE


POWERLINE
12V
80Ah (C20)
750A (EN)
+30%
POWER


Coin Cells
3 Volts Lithium
1.55 Volts Silver Oxide
Button Cells



Electrolyte



PRIMARY BATTERY

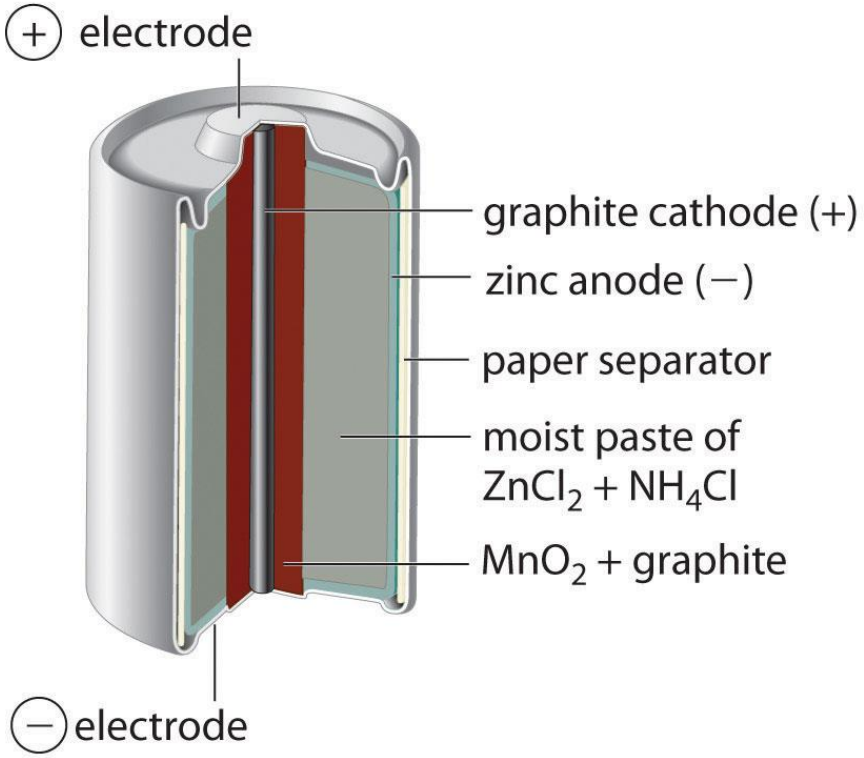
Primary batteries are non-rechargeable and disposable. The electrochemical reactions in these batteries are non-reversible. The materials in the electrodes are completely utilized and therefore cannot regenerate electricity.

SECONDARY BATTERY

Secondary batteries are rechargeable. These batteries undergo electrochemical reactions that can be readily reversed. The chemical reactions that occur in secondary batteries are reversible because the components that react are not completely used up. Rechargeable batteries need an external electrical source to recharge them after they have expended their energy.

PRIMARY CELL

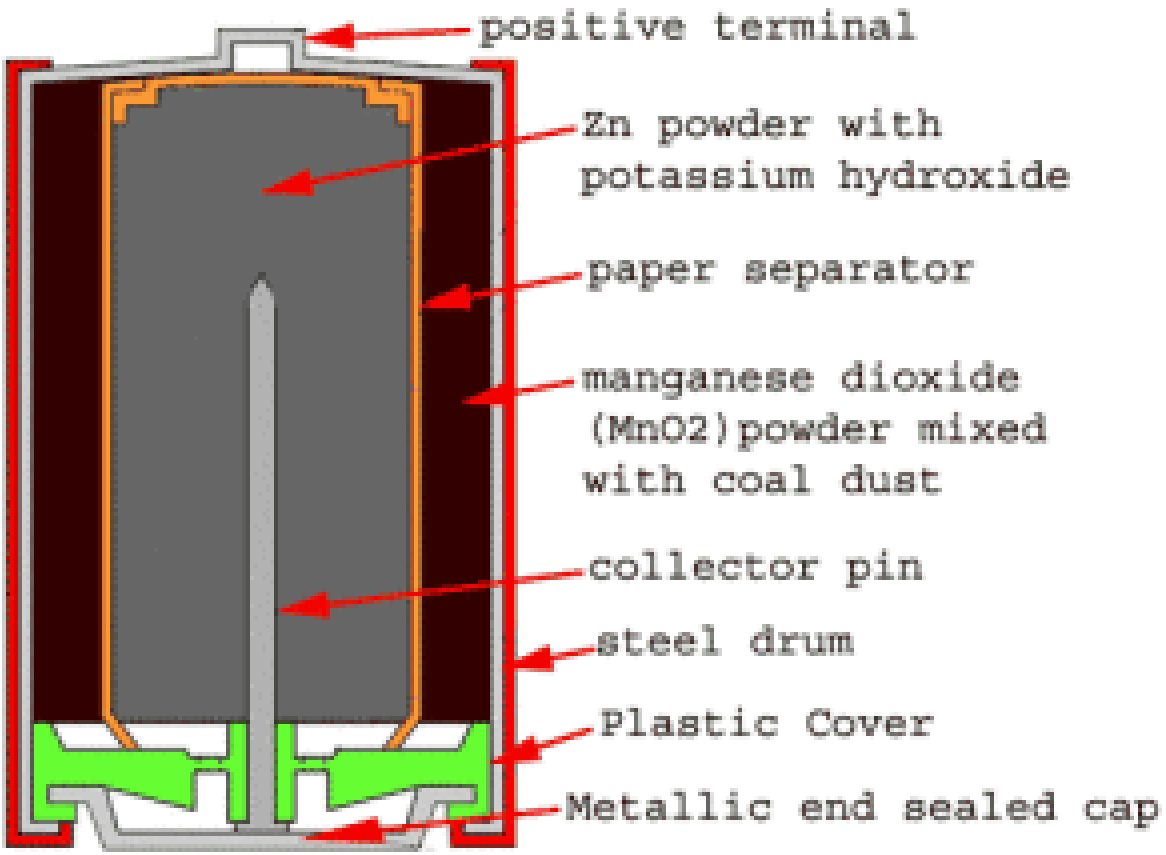
LECLANCHE CELL



cell reaction:

$2MnO_2(s) + 2NH_4Cl(aq) + Zn(s) \rightarrow$
$Mn_2O_3(s) + Zn(NH_3)_2Cl_2(s) + H_2O(l)$

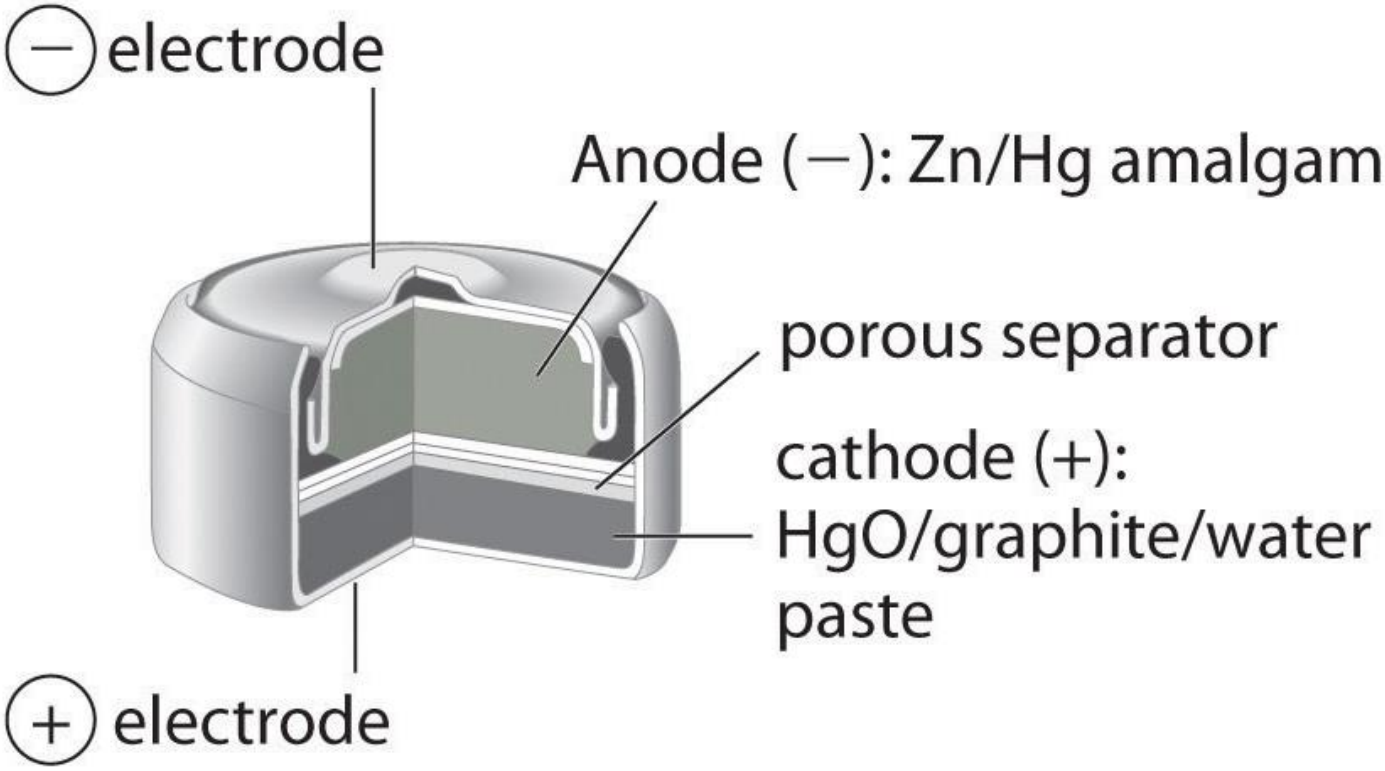
ALKALINE BATTERY



Alkaline Battery

$$Zn_{(s)} + 2MnO_{2(s)} \rightleftharpoons ZnO_{(s)} + Mn_2O_{3(s)}$$

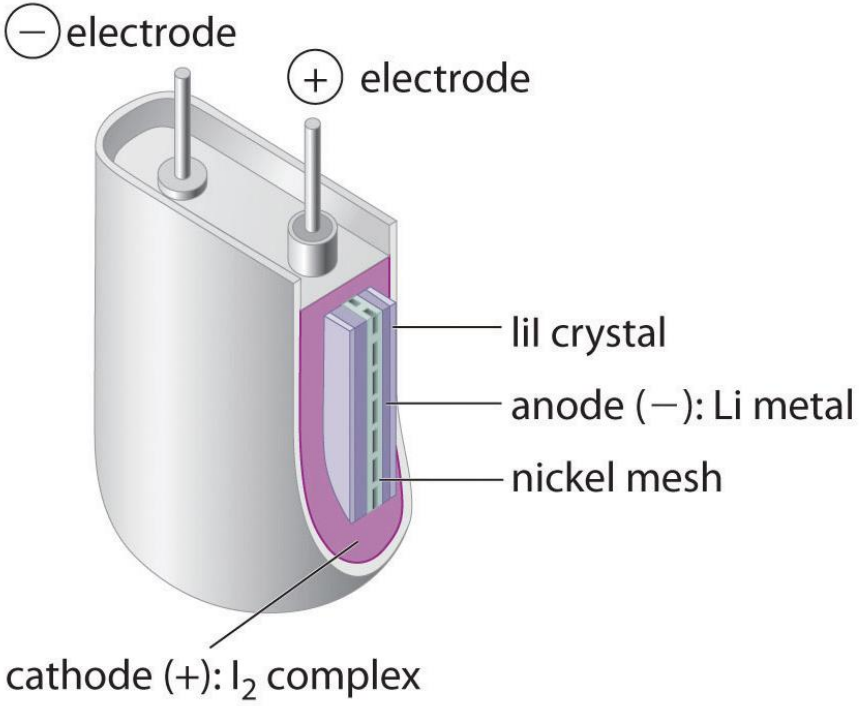
ALKALINE BATTERY



cell reaction:

$$Zn(s) + HgO(s) \rightarrow Hg(l) + ZnO(s)$$

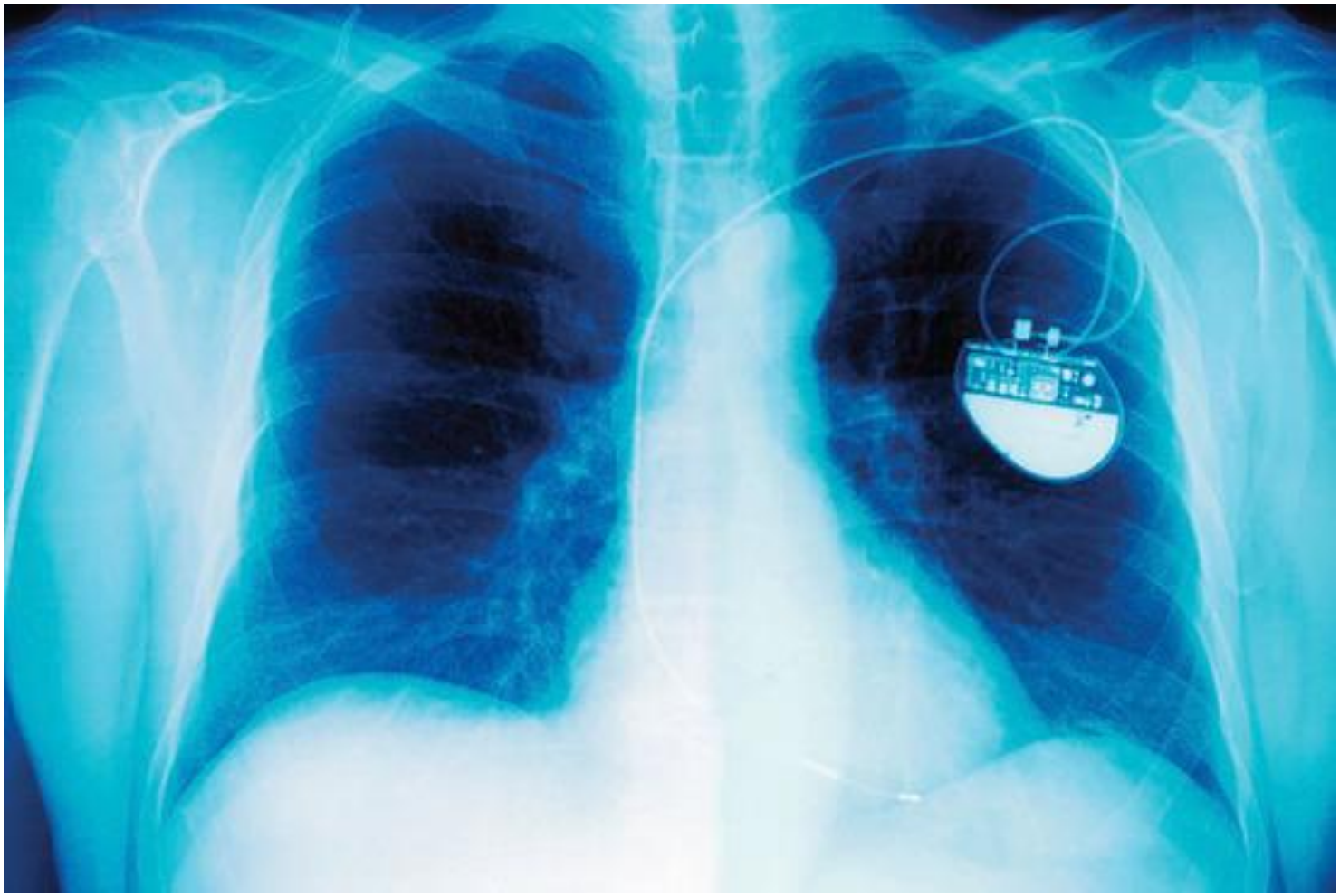
LITHIUM-IODINE BATTERY



cell reaction:

$2Li(s) + I_2(s) \rightarrow 2LiI(s)$

Lithium-Iodine Battery



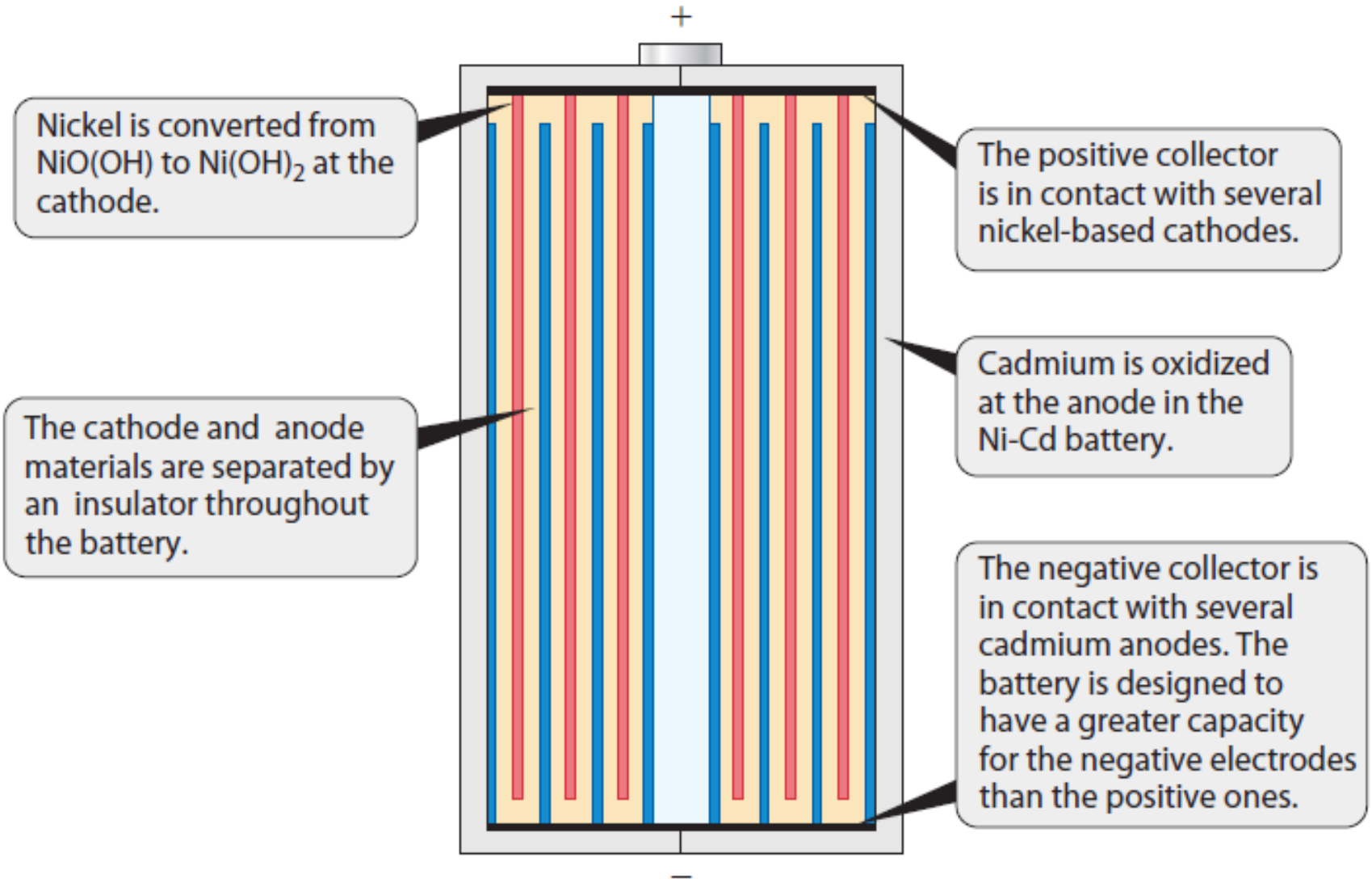
Lithium-iodine, 830 mA h

Lithium silver vanadium oxide/
carbon monoflouride, 120 mA h

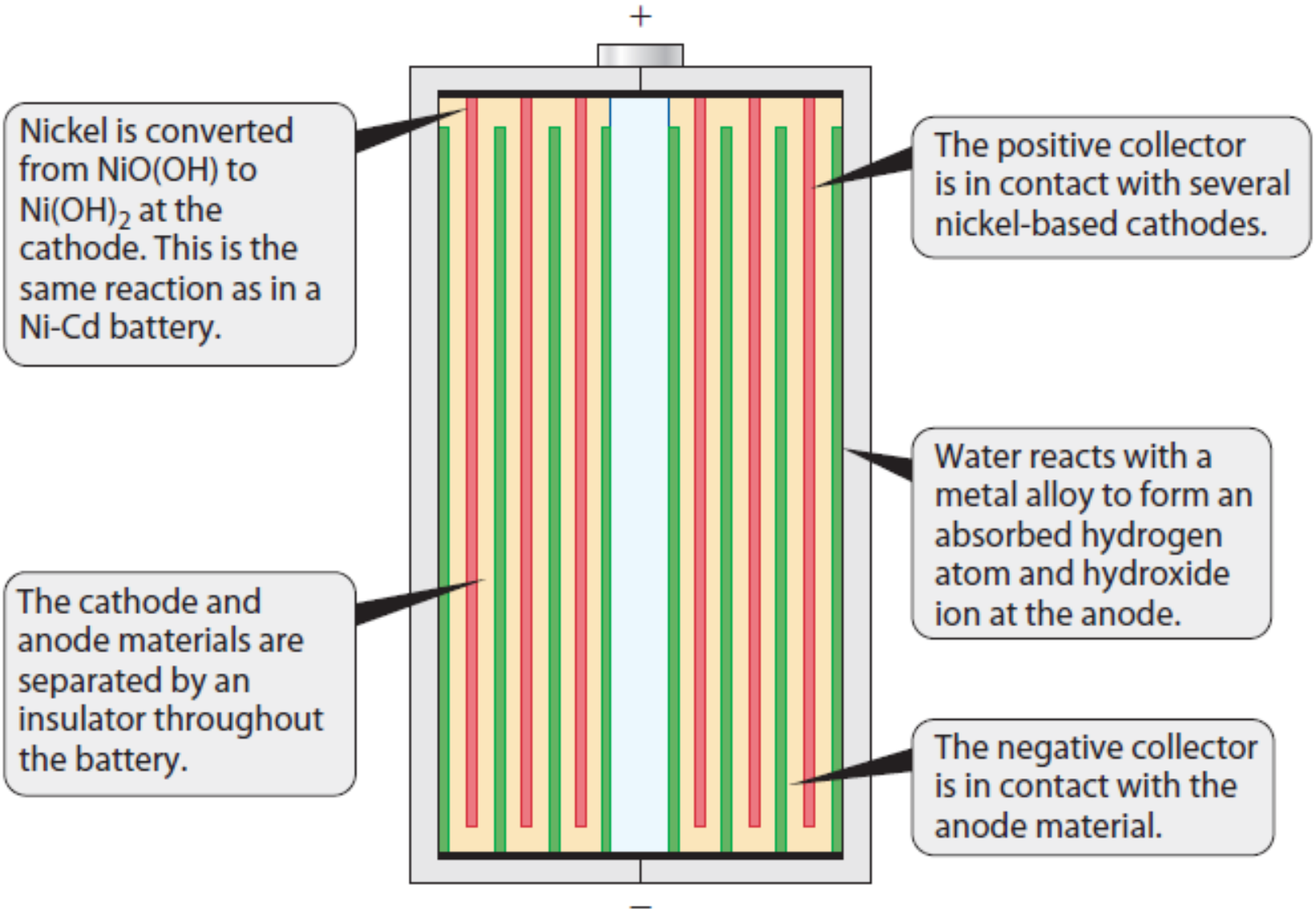
Pacing electrodes placed directly on the pacemaker capsule:
Cathode: 2.5 mm2TiN-coatedand sintered, located at tip.
Anode: 22 mm2 TiN-coated, located on ring on body

SECONDARY CELL

NICKEL-CADMIUM CELL



Nickel-Metal Hydride Cell



CORROSION

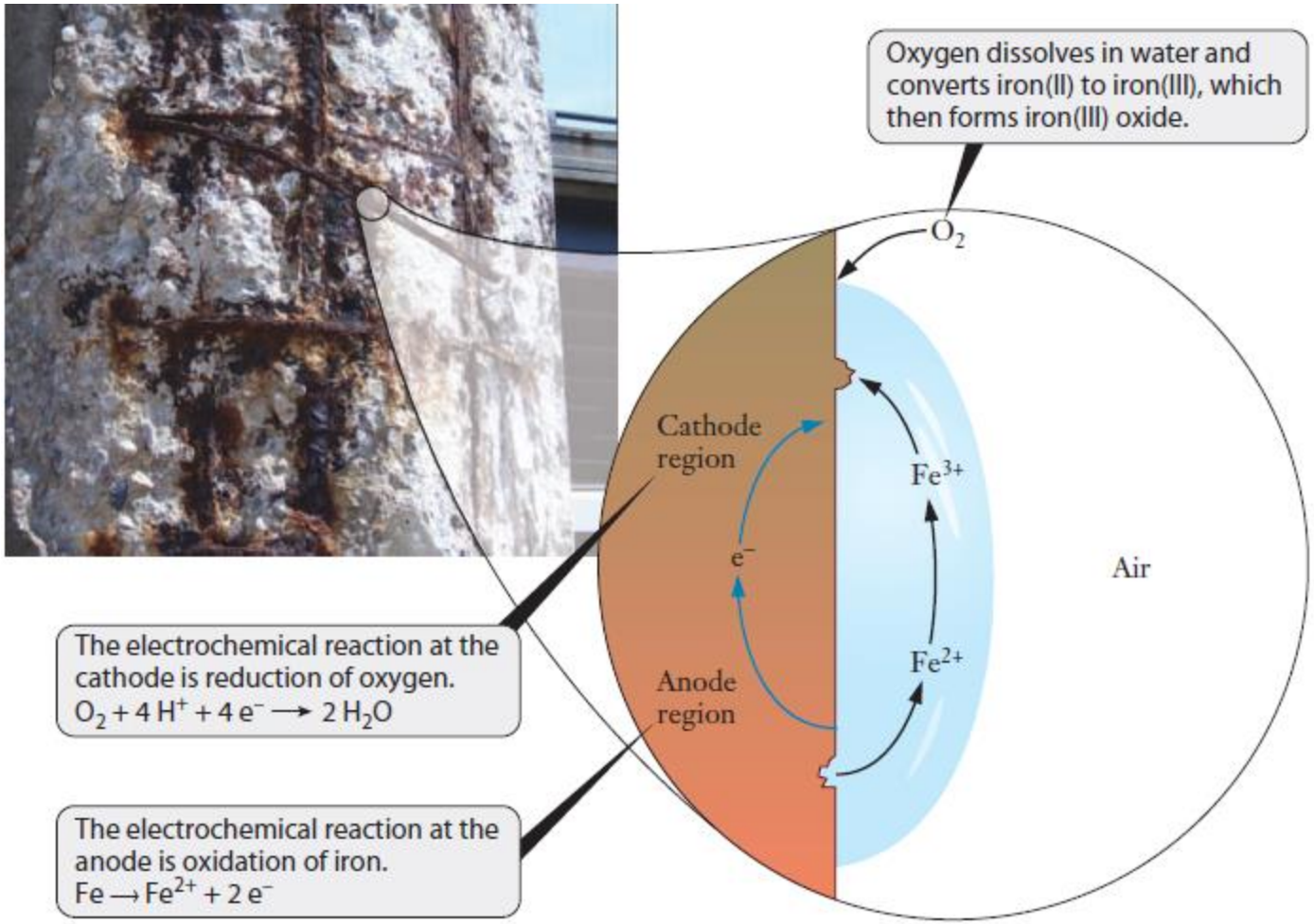
An irreversible interfacial reaction of a material (metal, ceramic, polymer) with its environment which results in consumption of the material or in dissolution into the material of a component of the environment. Often, but not necessarily, corrosion results in effects detrimental to the usage of the material considered. Exclusively physical or mechanical processes such as melting or evaporation, abrasion or mechanical fracture are not included in the term corrosion.

CLASSIFICATION OF CORROSION

1. **DRY OR CHEMICAL CORROSION**
    1. Corrosion by Oxygen
    2. Corrosion by Hydrogen
    3. Corrosion by loss of Carbon – Decarburization
    4. Corrosion by liquid metals

2. **WET OR ELECTROCHEMICAL CORROSION**
    1. Reduction of protons
    2. Reduction of Oxygen

FORMATION OF RUST



TYPES OF ELECTROCHEMICAL CORROSION

The electrochemical corrosion is classified into the following two types:

(i) Galvanic (or Bimetallic) Corrosion

Zn/Cu System

Example : Steel pipe connected to copper plumbing.

(ii) Differential aeration or concentration cell corrosion

When a metal surface gets exposed to electrolytes of varying concentrations, there develops a potential difference.

Example : Buoys in ocean.

FACTORS INFLUENCING CORROSION

1. **NATURE OF METAL**
    1. Physical state
    2. Purity
    3. Corrosion film
    4. Cathode / Anode surface areas

2. **NATURE OF ENVIRONMENT**
    1. Atmosphere
    2. Temperature
    3. Humidity
    4. Pollution
    5. pH

ELECTROCHEMICAL PROTECTION AGAINST CORROSION

1. Sacrificial Anode Method

2. Impressed Current Method