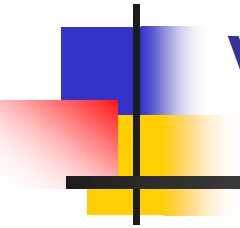
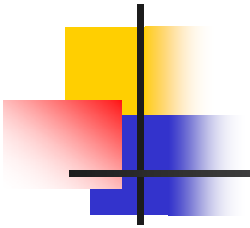


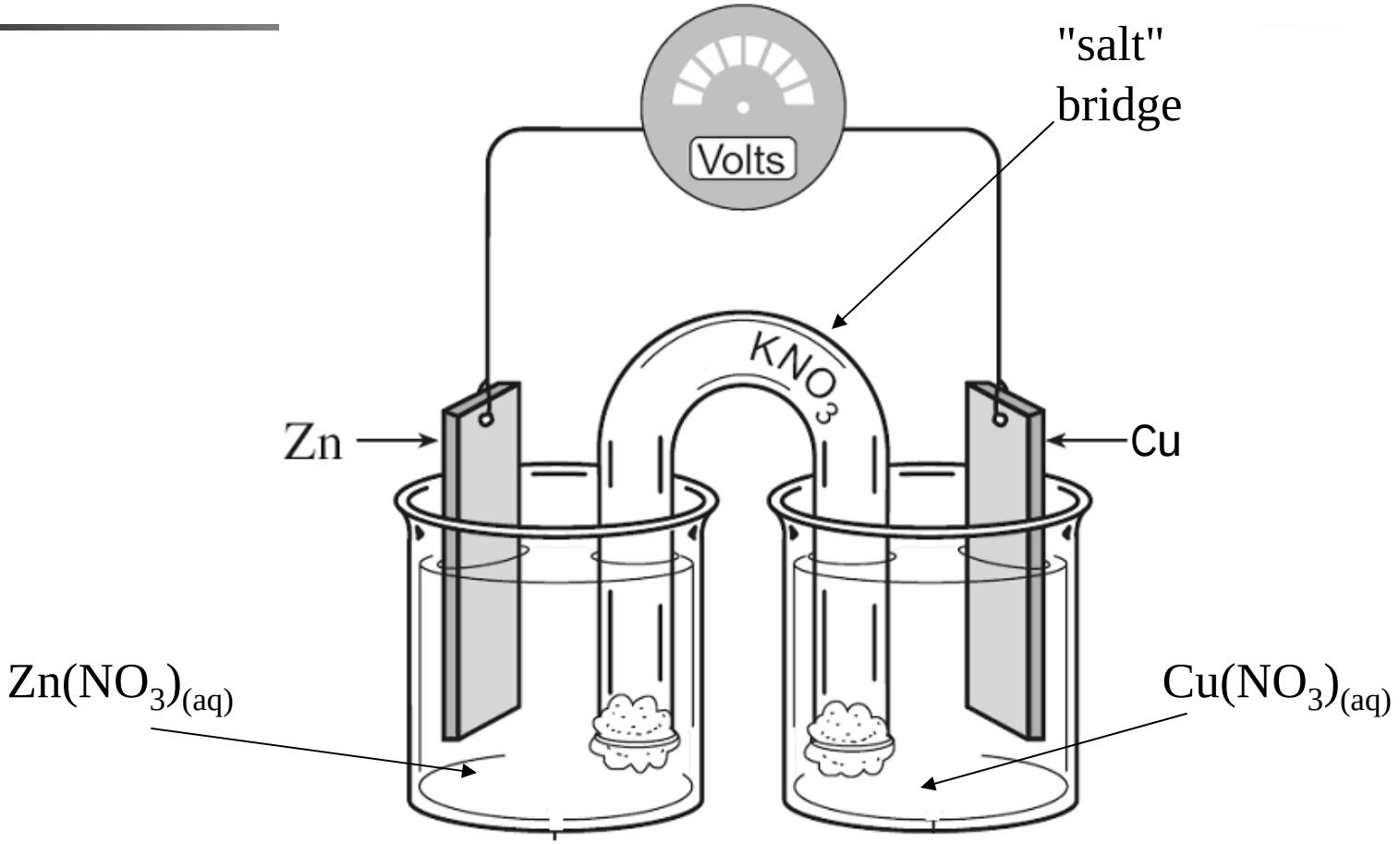
Voltaic Cells

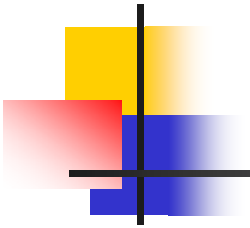
- a voltaic cell uses spontaneous redox reactions to create an electric current (a "battery")
- named in honour of Alessandro Volta who made the 1st battery out of Zn and Cu discs separated by a piece of cardboard that had been soaked in saltwater



- placing a metal that easily loses electrons into a solution with metal ions that gains electrons will result in a spontaneous reaction
- ions flow through the electrolyte and the electrons flow through a wire from the anode to the cathode
- chemical energy is being changed into electrical energy

Typical Voltaic Cell



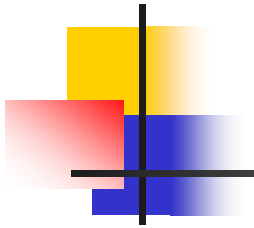


- zinc metal will lose electrons and go into solution, the released electrons will flow through the wire to the copper electrode

- Cu^{2+} ions will gain electrons and be reduced to Cu(s)

- the salt bridge completes the electric circuit by permitting the NO_3^- (anions) to move from the copper solution to the zinc solution

- Anions (- ions) are attracted to the anode
- Cations (+ ions) are attracted to the cathode



- oxidation occurs at the anode
- reduction occurs at the cathode

- the most stable metal will be the cathode (ions will be more easily reduced to the metal)

- Electrons do not move through the salt bridge and electrolyte

- the voltage will depend on how far apart the half-reactions are in the chart

- close together will result in a low voltage cell

Practice

- P 91: #36, 37