Announcements

- Turn on the Clicker (the red LED comes on).
- Push “Join” button followed by “20” followed by the “Send” button (switches to flashing green LED if successful).

- Starting Chapter 18 today. This is the last chapter of the semester.

- Quiz tomorrow will cover chapter 17 material not on previous quiz and the beginning of chapter 18.
- Wear clothes you do not care about to lab this week.

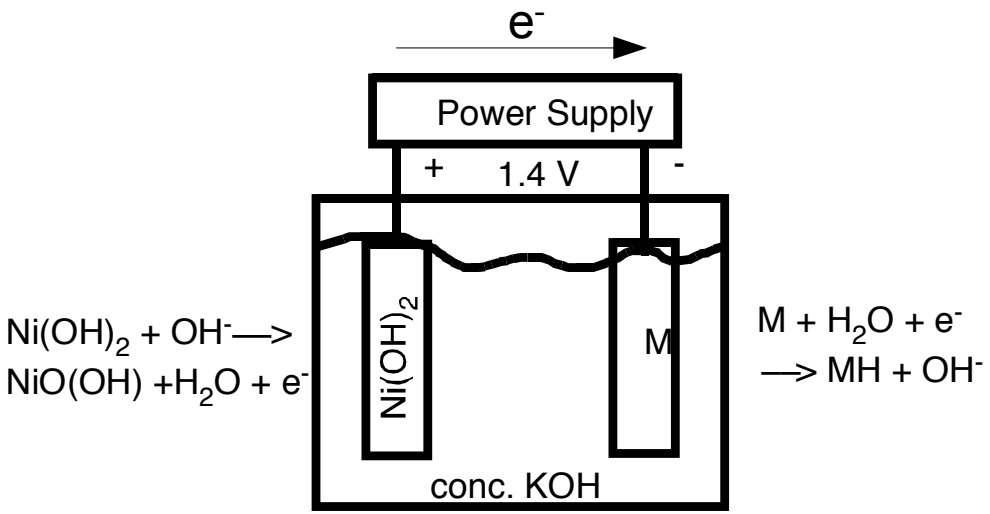
Review

- Total energy capacity of batteries in terms of moles (or grams) of reagent available or used versus coulombs (charge) passed or amp-hours.
- Electrolysis and recharging batteries.
  - Any pair of reactions where $|E_1-E_2|$ less than $V_{applied}$ can go.
  - RXN with highest E^o_{red} in a pair will go in reverse as an oxidation.
  - Pair with the smallest potential difference is the most likely.
  - RXNs that use species(reactants) in low concentration are not very likely.
  - Reduction of alkali metal ions (K^+, Na^+, etc) to metal is unlikely since the metals reoxidize with water to form $M^+ + OH^- + H_2(g)$
  - RXNs that produce gases have an **overpotential,** so go very slowly without a significantly larger potential difference than the one expected from reduction potentials.
- Fuel cells and low emission vehicles.

Reduction Potentials for NiMH

	E^o (V)		E^o (V)
$NiO(OH) + H_2O + e^- \longrightarrow Ni(OH)_2 + OH^-$	1.32	$2H^+ + 2e^- \longrightarrow H_2$	0.000
$M(s) + H_2O + e^- \longrightarrow MH + OH^-$	0.0	$2H_2O + 2e^- \longrightarrow H_2 + 2\ OH^-$	-0.83
		$K^+ + e^- \longrightarrow K$	-2.95

Electrolysis



Chapter 18- Materials

Get a little piece of the copper wire that is being passed around. Don't do anything to it until I tell you to.

- Metals
  - —refining/smelting –Alloys –physical properties
- Ceramics
  - –Clay –making ceramics –physical properties
- Semiconductors
  - –Band theory –doping –photovoltaics
- Polymers
  - –cellulosic –proteins
  - –properties from inter- and intra-molecular interactions
  - –condensation vs addition polymers

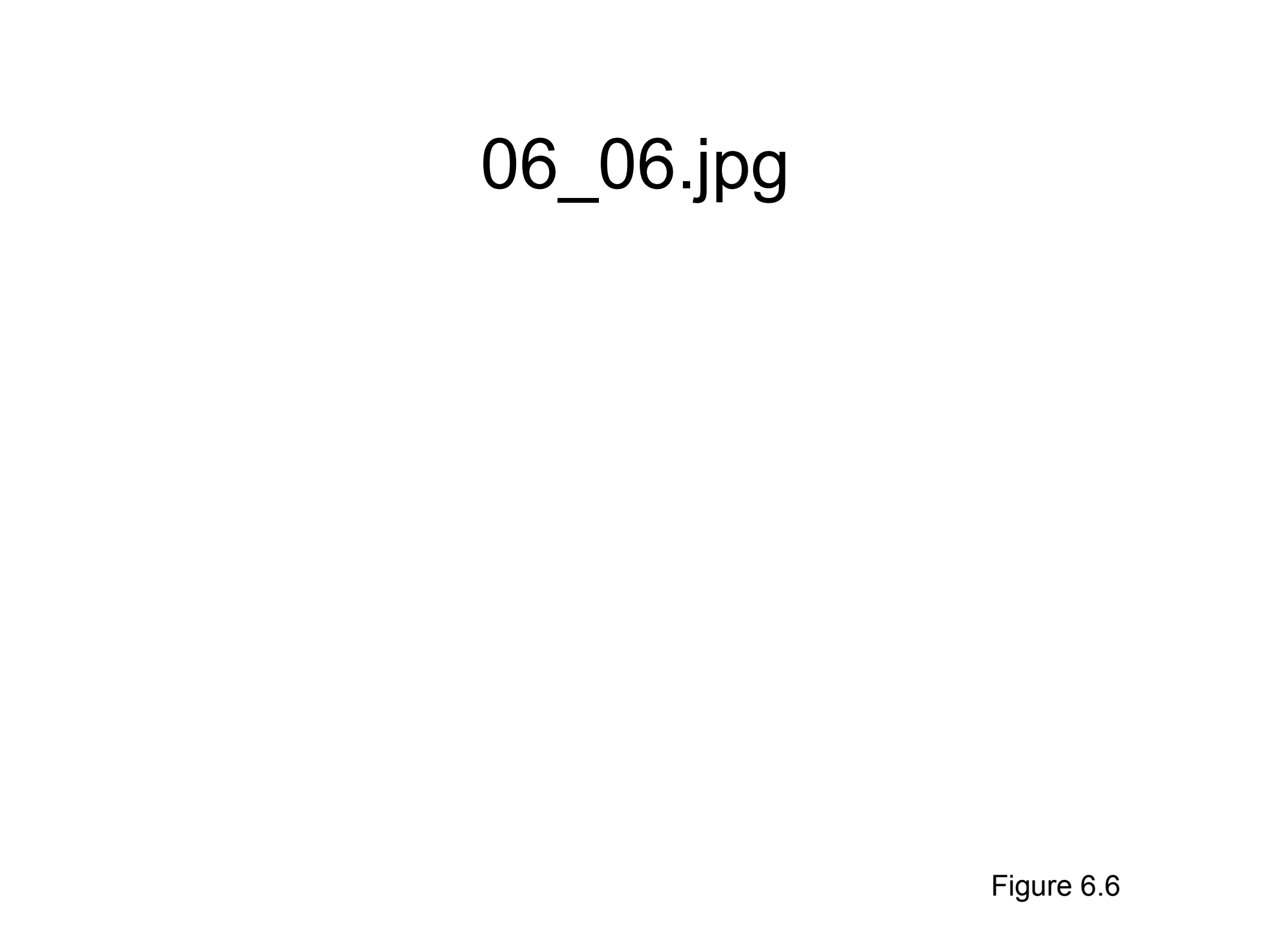


Figure 6.6

18_04.jpg

Figure 18.4

18_05.jpg

Figure 18.5

18_08_n.jpg

Figure 18.8