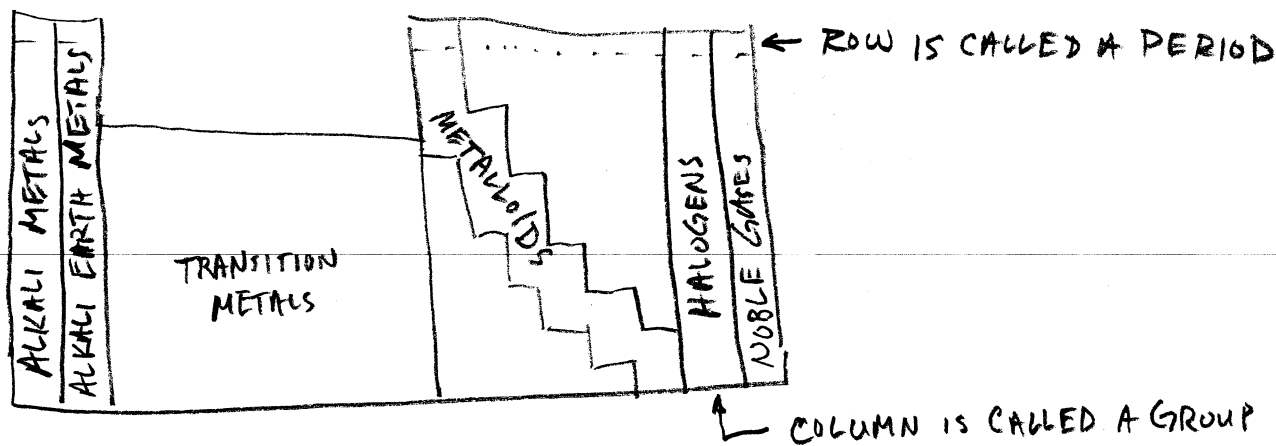


(1)



(2) DOT DIAGRAMS



(3) Calcium (Ca) atomic # = 20 → 20 protons, 20 electrons  
atomic mass = 40.08

(b) # neutrons = atomic mass - atomic number  
= 40 - 20 = 20

(4)

Cl	p = 17	e = 17	n = 35 - 17 = 18
Au	p = 79	e = 79	n = 197 - 79 = 118
C	p = 6	e = 6	n = 12 - 6 = 6

(5) metals react with non metals  
(right hand side of chart reacts with left hand side)

Na reacts with → O, F

I reacts with → Li

C reacts with → K, Se, Ag (since it is in the middle)

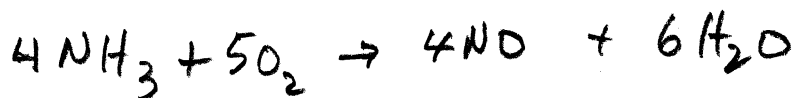
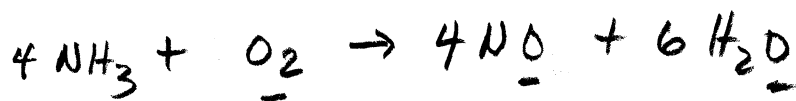
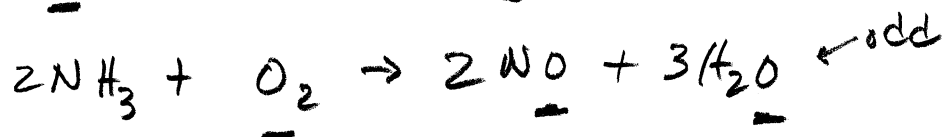
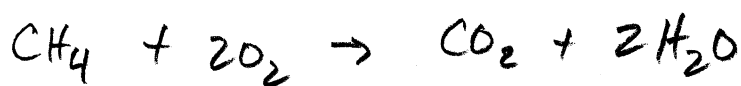
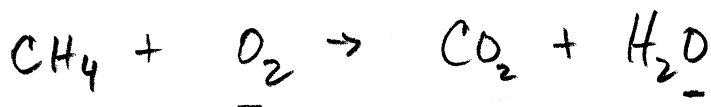
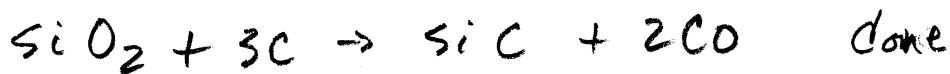
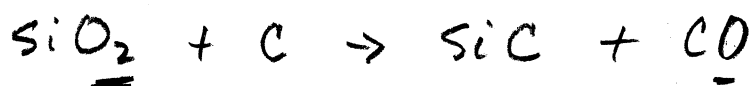
(6) stable atoms all want 8 e<sup>-</sup>, they can gain or lose

Al → has 3, loses 3

Si → has 4, gains 4 or loses 4

Br → has 7, gains 1

(7) balance



(8) copper stayed in the system but changed form from solid wire to atoms dissolved in acid (blue)

(9) percent comp.

$$\begin{aligned} \text{H}_2\text{O} \quad \text{molar mass} &= \text{H} + \text{H} + \text{O} \\ &= 1 + 1 + 16 \\ &= 18 \end{aligned} \quad \begin{aligned} \% \text{H} &= \frac{1+1}{18} \\ &= \frac{2}{18} \\ &= 12\% \end{aligned} \quad \begin{aligned} \% \text{O} &= \frac{16}{18} \\ &= 88\% \end{aligned}$$

$$\begin{aligned} \text{Ca}(\text{OH})_2 \quad \text{molar mass} &= \text{Ca} + \text{O} + \text{H} + \text{O} + \text{H} \\ &= 40 + 16 + 1 + 16 + 1 \\ &= 74 \end{aligned}$$

$$\begin{aligned} \% \text{Ca} &= \frac{40}{74} = 54\% \\ \% \text{O} &= \frac{32}{74} = 43\% \\ \% \text{H} &= \frac{2}{74} = 2\% \end{aligned}$$

(10) molar mass (off chart)

$$\begin{aligned} \text{Al}(\text{NO}_3)_3 &= \text{Al} + \text{N} + \text{O} + \text{O} + \text{O} + \text{N} + \text{O} + \text{O} + \text{O} + \text{N} + \text{O} + \text{O} + \text{O} \\ &= \text{Al} + 3 \cdot \text{N} + 9 \cdot \text{O} \\ &= 27 + 3 \cdot 14 + 9 \cdot 16 = 213 \text{ grams} \quad (\text{try \% comp?}) \end{aligned}$$

$$\begin{aligned} \text{AuO} &= \text{Au} + \text{O} \\ &= 197 + 16 = 213 \text{ grams} \end{aligned}$$

(11) moles always equal  $6.02 \times 10^{23}$  particles  
moles always equal the molar mass on chart (12 grams of C)

$$36 \text{ grams of } \text{H}_2\text{O} \quad \text{mm } \text{H}_2\text{O} = 1 + 1 + 16 = 18$$

$$36 \text{ grams} = \frac{36}{18} = 2 \text{ moles (18 gr + 18 gr)}$$

$$1 \text{ g } 6.02 \times 10^{24} \text{ atoms}$$

$$6.02 \times 10^{23} \times 10 \text{ atoms} = 10 \text{ moles}$$

(12) the razor blades created a very narrow and very straight beam of light  
the diffraction grating split the light into different colors  
the dark box allowed you to observe the color bands

(13) a couple drops was enough because all you wanted to know was if a reaction happened

5 indications a reaction is taking place:

- (1) gas forms
- (2) heat change (endo/exo)
- (2) color change
- (4) light given off.
- (5) precipitate forms

(14) Kinetic Theory

(1) All matter is made of tiny particles

(2) The particles are in constant random motion

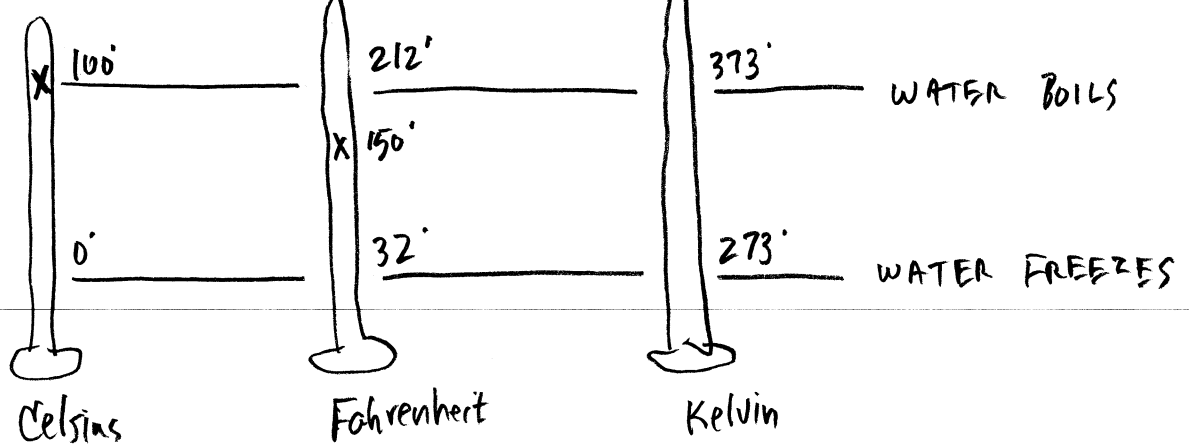
(3) When the particles hit each other or the container, no energy is lost

(15) calorimeter is used to measure energy changes in a reaction, it traps all heat energy inside

(16) temp goes up in calorimeter - exothermic  
temp goes down - endothermic

(17) ice melts - endothermic (energy going into ice)  
paper burns - exothermic  
grass growing - endothermic

(18)



100° Celsius is hotter

(19) Kelvin is different because it is set up so you can never have a negative temperature.

(20) Al high heat capacity heats up faster  
Fe lower heat capacity - holds heat better

(21) water is good in calorimeter  
- easy to get - water holds lot of heat  
- easy to fill (C = 4.18)

(22) salt bridge was fruit juice, completes circuit

(23) current is flow of electrons, measured in amps