

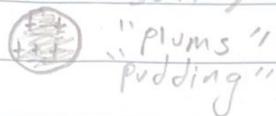
Atomic theory and structure of Atoms

Ruben
Module 3

Notes Chemistry

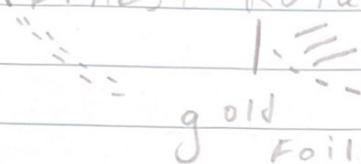
Plum pudding model

(J.J. Thomson)



Rutherford model

(Ernest Rutherford)



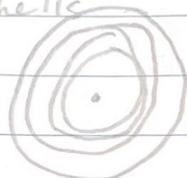
alpha particles
deflected
(+) charges
- solid -

Bohr model

(Neil Bohr)

Electrons held in shells
around a nucleus

i.e. solar
system



Quantum - Mechanical Model

Electrons orbit in regions



space of electron
orbits not clearly
defined orbit

The Atomic Number - Number
of Protons in Atom.

Mass Number - Number of protons and
neutrons in a nucleus. Left upper

Isotopes - Atoms with same number of protons
so neutrals but mass number are different.

Related but different.

c = constant representing the speed of light

h = Planck's constant

Frequency - How many times a wave length passes a certain point: measured in seconds

7 levels with orbitals

S = 2 electrons P = 6 electrons

d = 10e

f = 14e

8a = gasses

Relationship between frequency and energy
 $E = h \times f$

Aluminum = Atomic number = 13

Electrons = 13

Planck's constant $(6.63 \times 10^{-34} \text{ J}\cdot\text{s})$

f = frequency

Na = sodium

11 = protons and electrons

6

Carbon 6 protons and electrons

c = speed of light
 $30 \times 10^8 \text{ m/sec}$

$$f = \frac{c}{\lambda} \quad \lambda = \frac{c}{f}$$

Hz = 1 per second

$$1 \text{ nm} = 1 \times 10^9 \quad \lambda = \frac{c}{f}$$



Light: particle or wave? Evidence or both

Particle - Wave Duality Theory

Wavelength (measured in meters)



Visible spectrum

Red Longest (10^{-9} meters)
Orange
Yellow
Green
Blue
Violet Shortest

Electromagnetic Spectrum

Gamma
X-ray
Ultraviolet
Visible Spectrum

Wavelength and Frequency have an inverse relationship in seconds