

The Structure of Atoms Through Time - Summary

Aristotle

He believed everything was made up of 4 elements, which are earth, water, fire, and air.



Fire



water



air



earth

"4 Element Theory"

John Dalton

An atom is a very small sphere that is dense, and it cannot be broken up. (like a billiard ball)

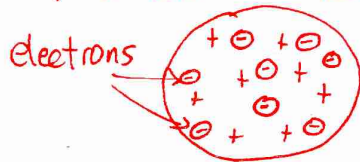


"The Billiard Ball Model"

JJ Thomson

An atom was a dense sphere that was positively charged, and it contained electrons that have a negative charge.

(Overall, an atom is neutral = same amount of positive and negative charges.)

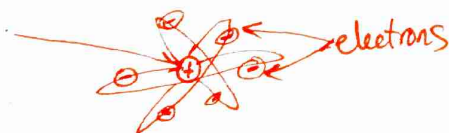


"The Plum Pudding Model"

Ernest Rutherford

An atom has a dense, positive nucleus ^{made of protons} and ^{has} negative electrons that are in empty space around the nucleus.

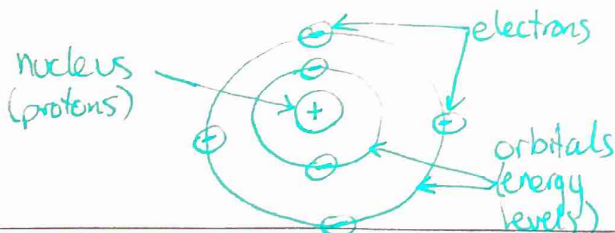
nucleus
(protons)



"The Nuclear Model"

Niels Bohr

An atom has a dense, positive nucleus, and the negative electrons around the nucleus are organized on orbitals (energy levels)



"Bohr Diagram"

or
"The Planetary Model"

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Remember: *NOTES

- Number of protons = atomic number because that's how they came up with the atomic number
- Number of electrons = number of protons because an atom needs the same amount of positive and negative charges
- Number of Neutrons = atomic mass - atomic number because neutrons and protons have mass (1amu). Electrons don't have mass.

Determining the Number of Atomic Particles

1. Each row in the table represents a different element. Use the information provided to fill in the required information for that element. ^{protons + neutrons}

Number of protons in the atom	Number of electrons in the atom	Number of neutrons in the atom	Atomic mass of the atom	Atomic number of the atom	Element name	Chemical symbol
7	7	7	14	7	nitrogen	N
5	5	6	11	5	boron	B
1	1	0	1	1	hydrogen	H
20	20	$40-20=20$	40	20	calcium	Ca
30	30	35	65	30	zinc	Zn
13	13	14	27	13	aluminum	Al
9	9	10	19	9	fluorine	F
23	23	28	51	23	Vanadium	V
17	17	18	35	17	chlorine	Cl
3	3	4	7	3	Lithium	Li
79	79	118	197	79	gold	Au
11	11	12	23	11	sodium	Na
33	33	42	75	33	arsenic	As
50	50	69	119	50	tin	Sn
19	19	20	39	19	potassium	K

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