ATOMIC THEORY

GREEKS → DEMOCRITUS ⇒ DISCONTINUISTS
↳ 'ATOMOS'

ARISTOTLE, PLATO → CONTINUISTS
↳ 4 elements (earth, air, fire, water)

LaVoisier France 1790's
→ Law of Conservation of Mass

1808 Dalton "ATOMIC THEORY" ← billiard ball model
- elements are composed of atoms
- in a chemical reaction the atoms are rearranged
- atoms of one element are distinguishable from atoms of another element
- compounds are composed of atoms of different elements combined in small whole number ratios (Law of Definite Proportions)

H_2O → 11% H, 89% O by mass

atom – the basic unit of an element that can be combined with another element to form a compound

1890's JJ Thompson → electrons (-)
cathode ray tube

Millikan → discovered mass of e⁻

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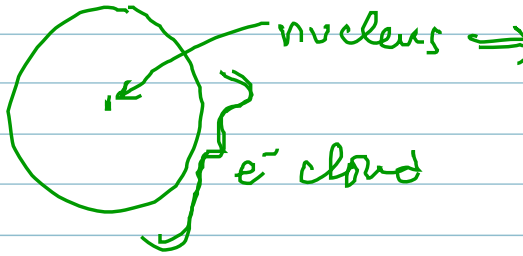
1895 Roentgen X-rays em radiation

Thompson ⇒ plum pudding model

Becquerel / Curie
↳ radioactivity < spontaneous emission
↳ α particle (+) $^4_2\alpha$ ^4_2He
↳ β particle (−) e^-
↳ γ rays

$^1_0n \longrightarrow {}^1_1p^+ + {}^0_{-1}e$ → β

1910 Rutherford's "gold foil" experiment
→ nuclear model



Atomic Number (Z) = # p^+ in nucleus

Mass Number (A) = # p^+ + # n^0

$A - Z = \#n^0$

isotopes → atoms of the same element w/ different mass #
↳ different # n^0

"heavy water" D_2O

isotope symbols ^A_ZX

$^{12}_6C$ $^{13}_6C$ $^{14}_6C$

$^{14}_6C \longrightarrow {}^0_{-1}\beta + {}^{14}_7N + {}^0_0D$

^1_1H protium
^2_1H deuterium
^3_1H tritium