CHARACTERISTICS OF SUB-ATOMIC PARTICLEES

PROPERTY	ELECTRON	PROTON	NEUTRON
DISCOVERY	JJ Thomson	E Goldstein	Chadwick
ABSOLUTE MASS	9×10^{-31}kg	1.6×10^{-27}kg	1.6×10^{-27}kg
RELATIVE MASS	1/1840u	1u	1u
CHARGE	negative	positive	no charge
ABSOLUTE CHARGE	-1.6×10^{-19}	$+1.6\times10^{-19}$	0
LOCATION	outside nucleus	inside nucleus	inside nucleus

THOMSON'S MODEL

limitations of JJ's model of an atom?

> couldn't explain stability of an atom, neutron & nucleus. acc. to him, mass of atom was uniformly distributed but mass is concentrated in the nucleus. results of experiments by scientists couldn't be explained by this model.

explain his model.

> an atom consists of a +vely charged sphere and e^- are embedded in it. -ve & +ve charges are equal in magnitude, so the atom is electrically neutral.

RUTHERFORD'S MODEL

any particle in a circular orbit would undergo acc.. during accn, charged particles would radiate energy. thus, revolving electrons would lose energy and fall into the nucleus. thus the atoms would be highly unstable but they're not.

radius of nucleus is about 10^5 times less than the radius of the atom.

BOHR'S MODEL

only certain special orbits known as discrete orbits of e^-, are allowed inside atom. while revolving, e^- don't radiate energy. these energy shells are represented by letters K,L,M,N.. or numbers n=1,2,3,4..

ATOMIC & MASS NUMBER

atomic number = total N^p OR N^e

ex; Na: 11, N^p OR N^e = 11

mass number = N^p+N^n [neuclons]

average atomic mass = mass no.×percentage+mass no.×percentage

ISOTOPES /\ ISOBARS

atoms of the same element having same atomic numbers but different mass numbers	atoms of different elements with different atomic numbers but same mass numbers
have same chemical properties but different physical properties	have different chemical properties but same physical properties
ex; $^{12}_{6}C$ $^{14}_{6}C$	ex; $^{40}_{20}Co$ $^{40}_{18}Ar$

isotope of: uranium- fuel in nuclear reactors; cobalt- treatment of cancer; iodine- treatment of goitre.

ELEMENTS & NEUTRONS

1. H: 0	7. N: 7	13. Al: 14
2. He: 2	8. O: 8	14. Si: 14
3. Li: 4	9. F: 10	15. P: 16
4. Be: 5	10. Ne: 10	16. S: 16
5. B: 6	11. Na: 12	17. Cl: 18
6. C: 6	12. Mg: 12	18. Ar: 22

SYMBOLS OF IONS

Sodium	Na^+
Potassium	K^+
Silver	Ag^+
Copper [I]	Cu^+
Magnesium	Mg^{2+}
Calcium	Ca^{2+}
Zinc	Zn^{2+}
Iron [II]	Fe^{2+}
Copper [II]	Cu^{2+}
Aluminium	Al^{3+}
Iron [III]	Fe^{3+}

SYMBOLS OF IONS [non-metallic elements]	
Hydrogen	H^+
Hydride	H^-
Chloride	Cl^-
Bromide	Br^-
Iodide	I^-
Oxide	O^{2-}
Sulphide	S^{2-}
Nitride	N^{3-}

SYMBOLS OF IONS [polyatomic ions]	
Ammonium	NH_4^+
Hydroxide	OH^-
Nitrate	NO_3^-
Hydrogen Carbonate	HCO_3^-
Carbonate	CO_3^{2-}
Sulphite	SO_3^{2-}
Sulphate	SO_4^{2-}
Phosphate	PO_4^{3-}

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