Atomic str

This chapter mainly deals with structure of atom

1) Dalton's atomic theory (1808)
2) Discovery of e^- by J. J Thomson (1897)
3) proton by Rutherford (1920)
4) Neutron by James Chadwick (1932)

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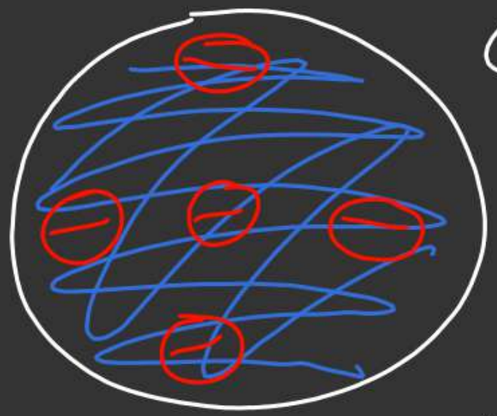
Thomson atomic model (1898)



Watermelon Model

or

plum pudding Model

Acc to thomson an atom is considered to be spherical in shape in which positive charge is distributed throughout the sphere and -ive charged $\bar{e}$ are embedded in it to make the whole atom electrically neutral

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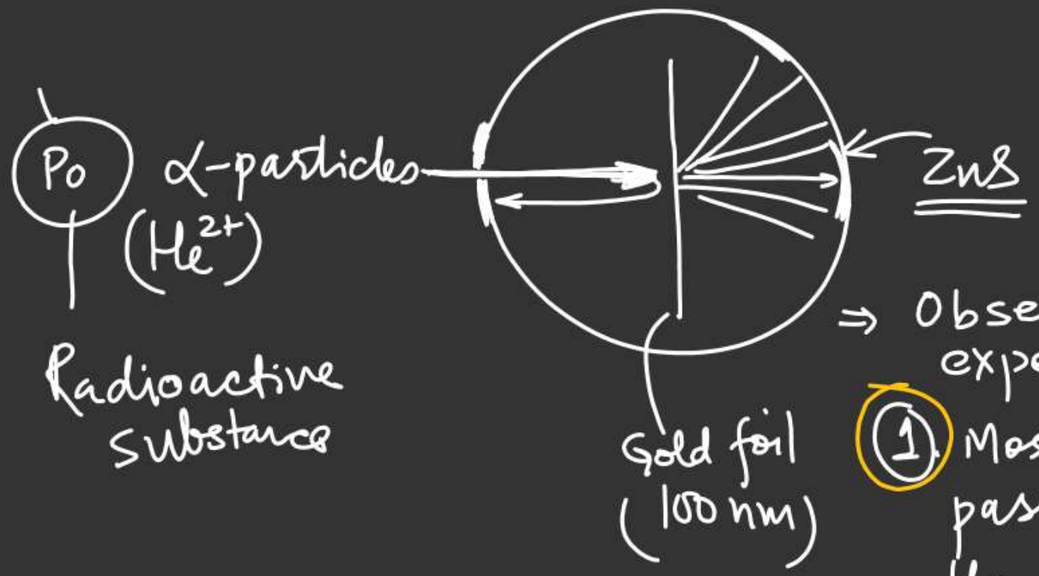
Rutherford atomic Model (1911)



Geiger

1 out of 20000

⇒ Observations of Rutherford experiment

(1) Most of the α-particles passed undeflected through the gold foil.

(2) Small fractions of α-particles was deflected by small angles

(3) 1 out 20000 α-particles bounced back (deflected by 180°)

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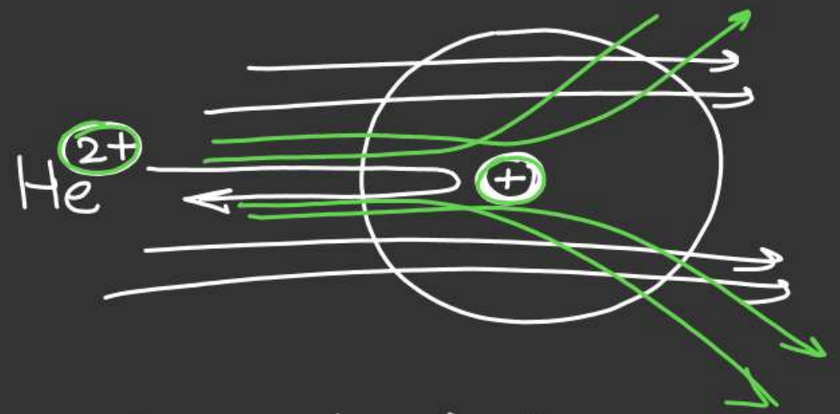
(11) Conclusion of Rutherford experiments



(1) Most of the space in an atom is empty as most of the α-particles passed undeflected.

(2) are bounced back this deflection must be due to enormous repulsion force. Therefore it was concluded that tive charge has to be concentration in a very small region that repelled and deflected the α-particles

(3) Calculations by Rutherford showed that radius of atom is about 10^{-10} m while that of nucleus is 10^{-15} m.

(3) Rutherford nuclear atomic model

(1) All the proton and neutrons are present at the centre of an atom in a very small volume called Nucleus.

(2) Nucleus is surrounded by the e^- that move around the nucleus in circular path called orbits.

(3) Electrons and nucleus are held together by electrostatic force of attraction.

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O-I

(13) (b)

$B = b - \frac{a}{RT}$

B ↑

$\frac{B}{V_m}$

(i) False

(ii) True

(iii) True

(17) $V_C = \frac{mass}{d_C}$

$V_C = \frac{44}{0.44}\ cm^3 = 100\ cm^3 = 3b = 3 \times 4 \times \frac{4}{3}\pi r^3 \times N_A$

(18) 'a'

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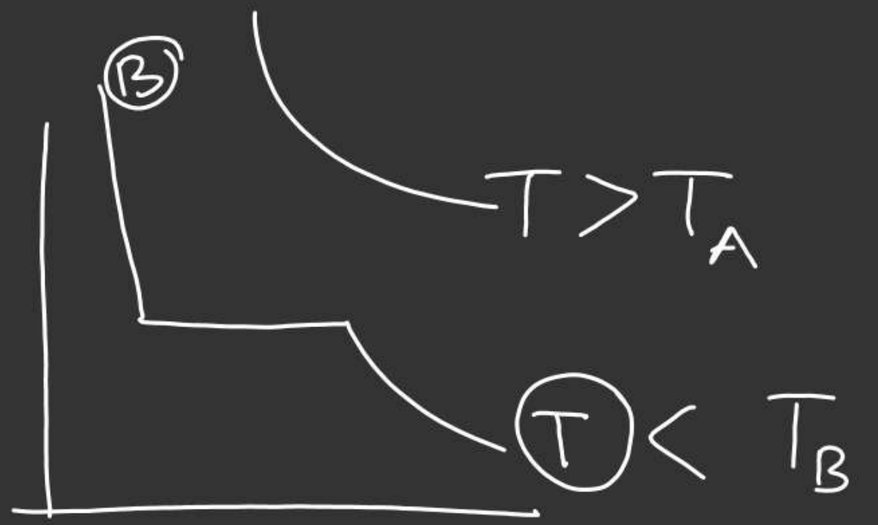
(20)



✓ (A) Ans

(14) T_c $H_2O > O_2$

$T_c = \frac{8a}{27Rb}$

(7) J-M

Xe

$Z = 1 + \frac{Pb}{RT}$

(4) Cl_2 C_2H_6

(8) Gas A Gas C

b same

B D

B D

a same

Q.(5) A & C

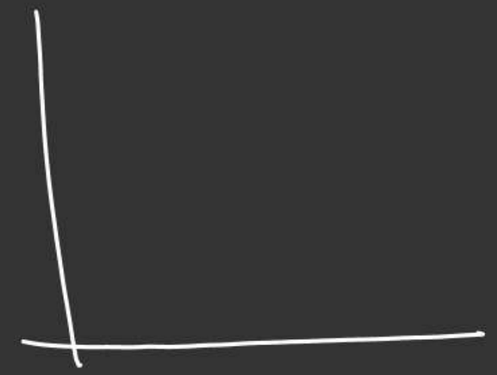
$B = b - \frac{a}{RT}$

$C = b^2$

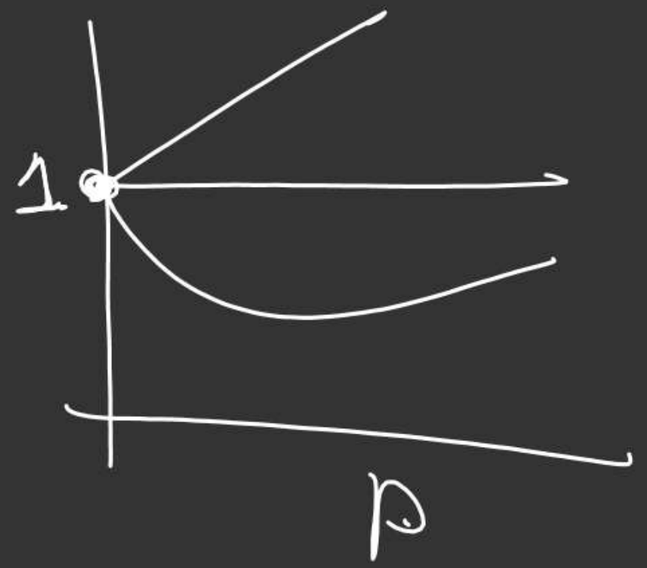
(5)

$$Z = 1 - \frac{a}{V_m RT}$$

$$Z = 1 - \frac{a \times P}{Z(RT)^2}$$



(2)



$$\frac{PV_m}{RT} = 1$$

$$PV_m = RT$$