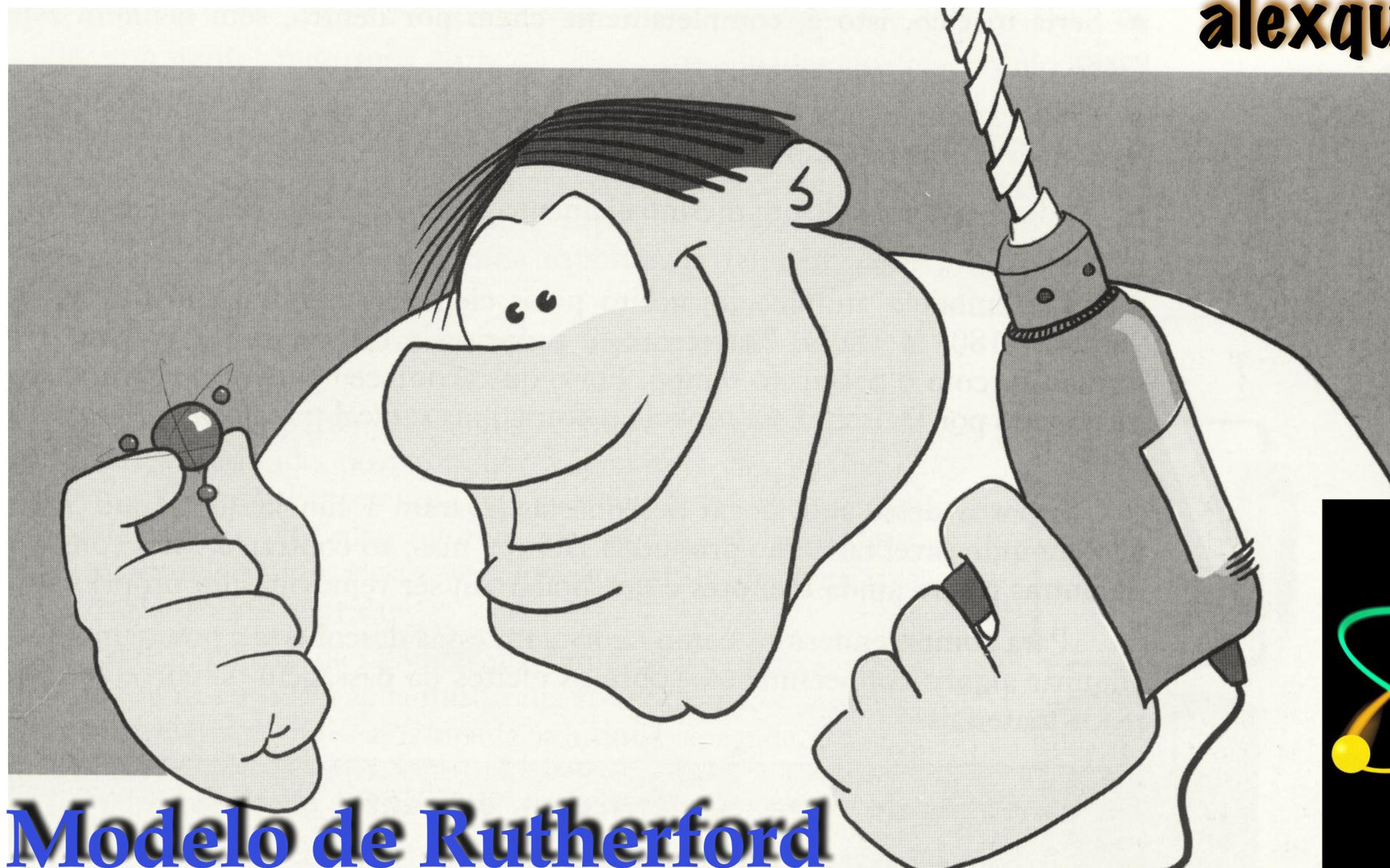


Modelos Atômicos

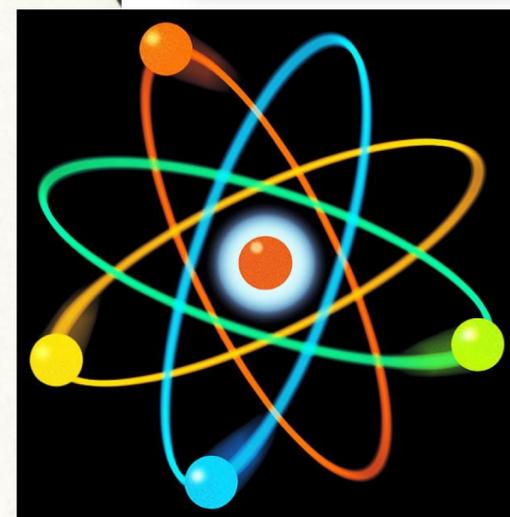
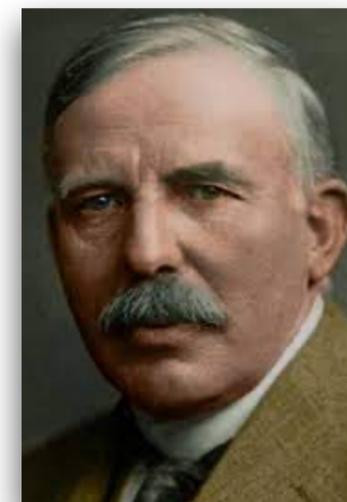
alexquimica.com



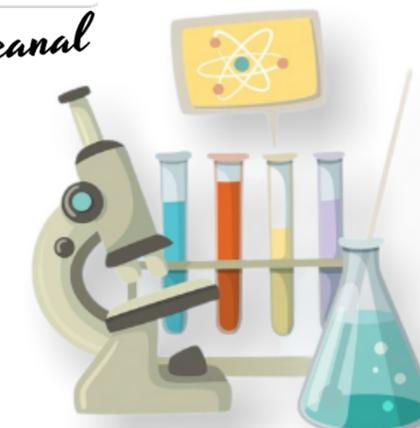
alexdiniz1402q



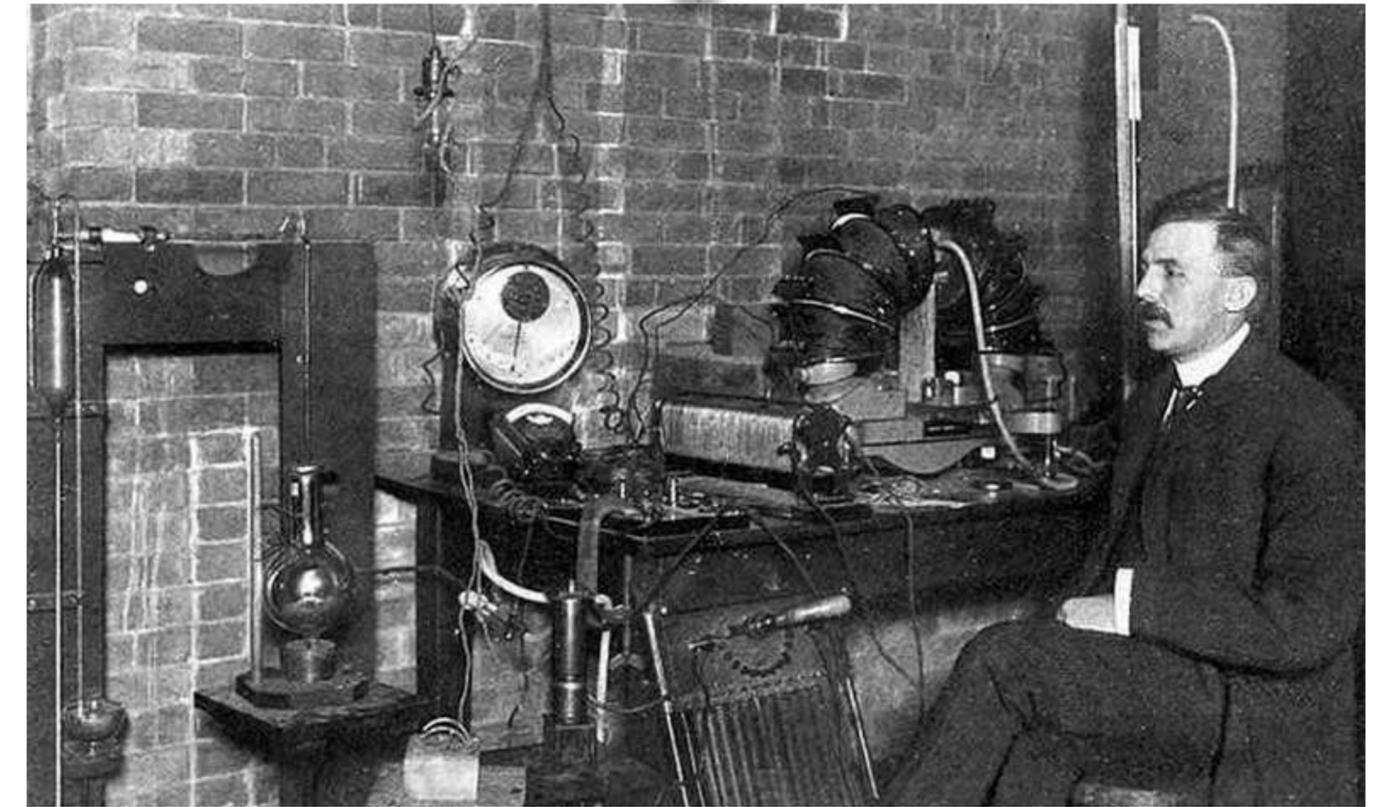
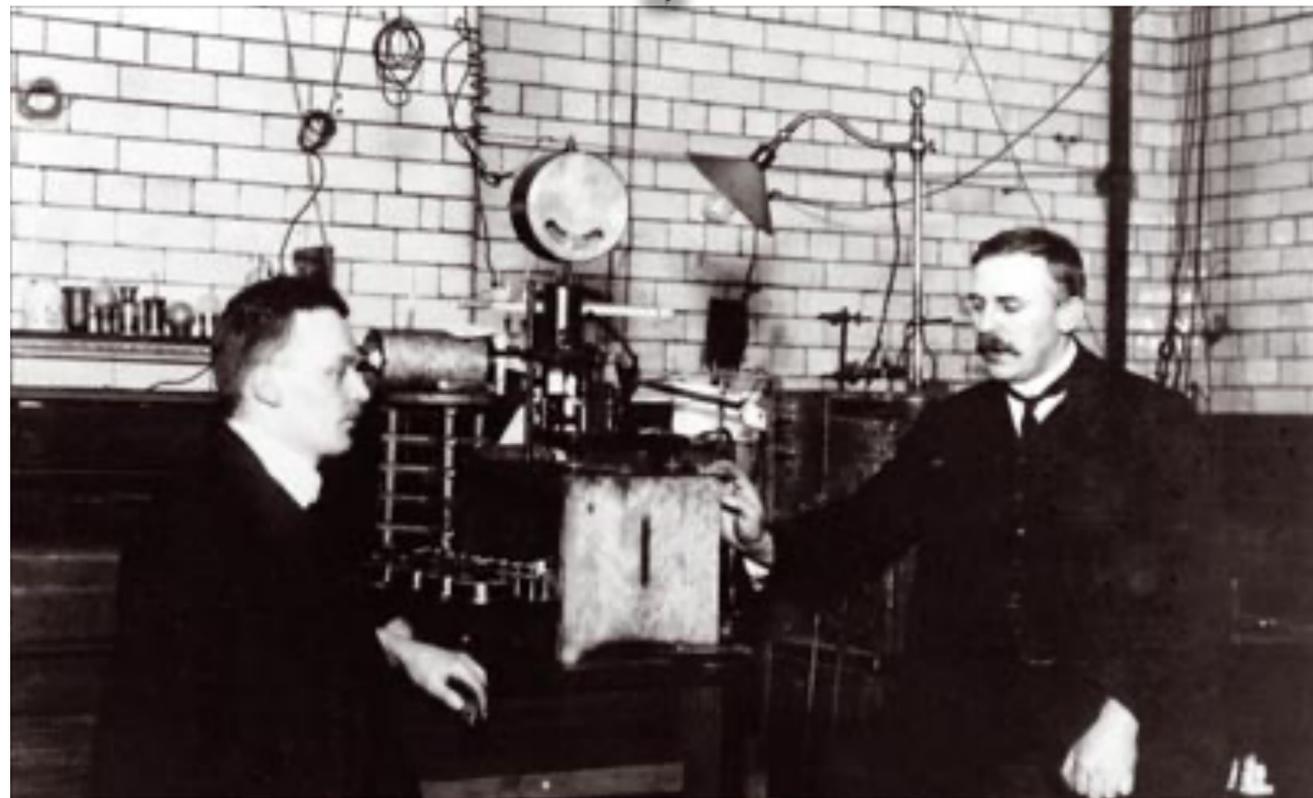
Modelo de Rutherford



acesse o canal



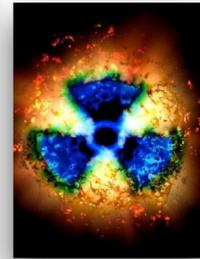
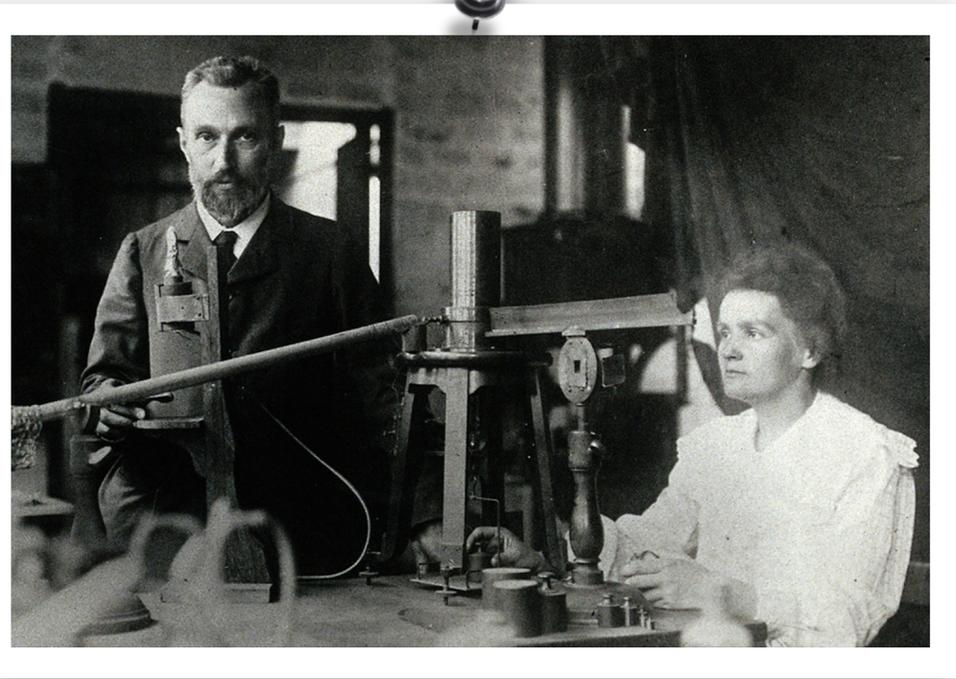
Prof: Alex



Em 1904 Ernest Rutherford, fazendo um experimento com gás hidrogênio em ampola de raios canais, descobriu uma partícula 1836 vezes mais pesada e de caráter positivo, ao qual chamou de próton.

(Mais tarde o mesmo próton é isolado pelo próprio Rutherford, em uma reação nuclear)

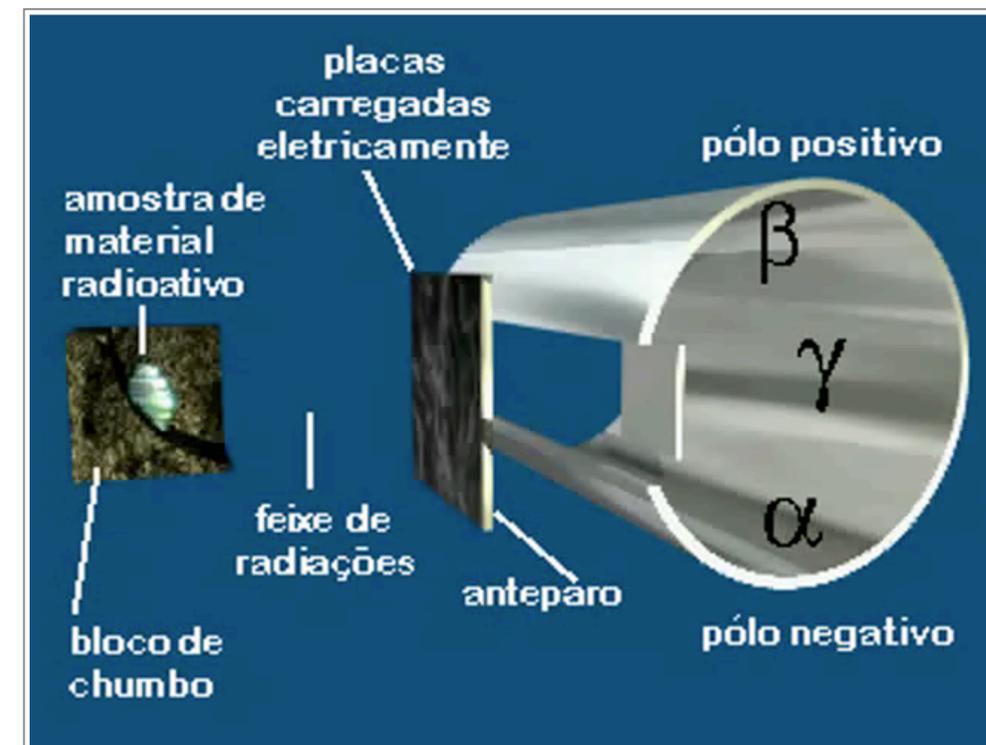
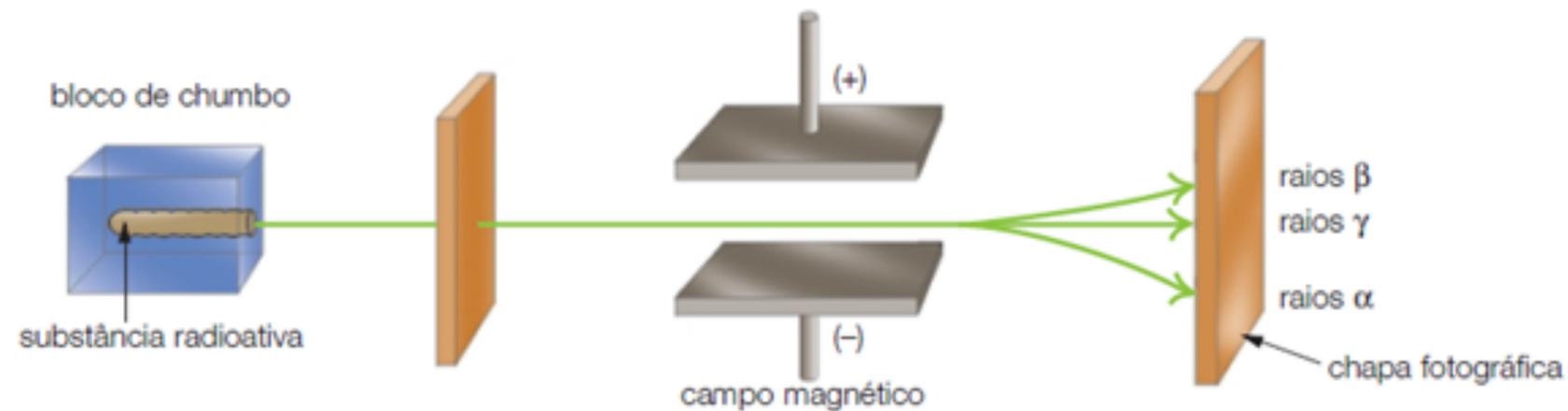




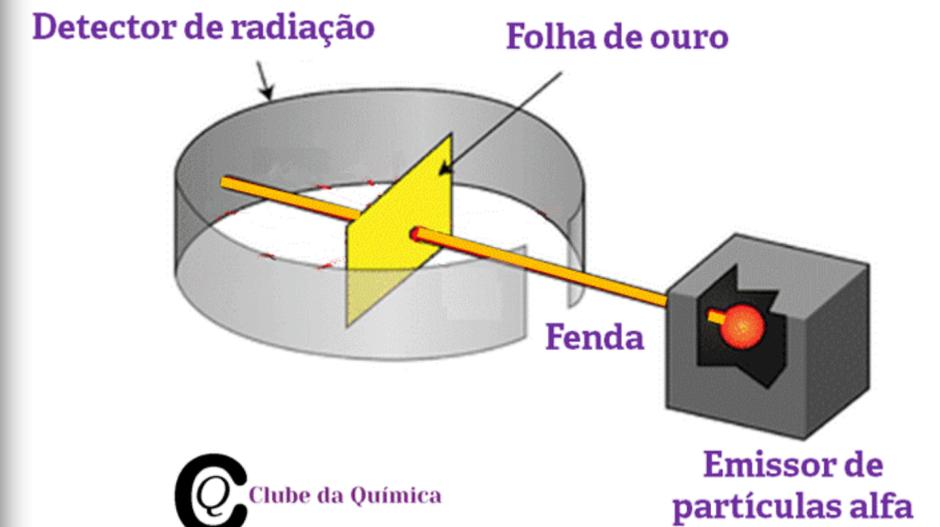
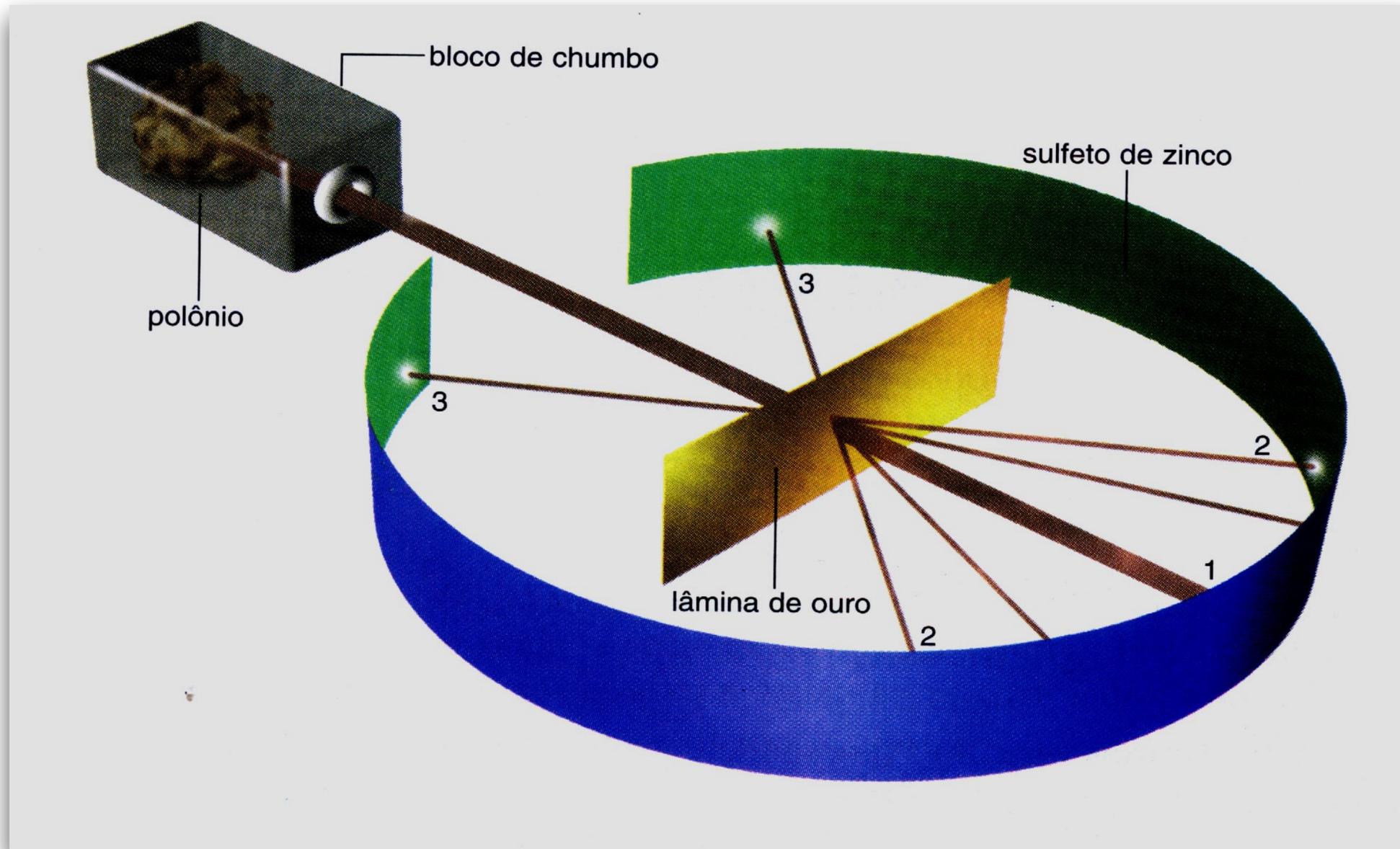
A Radioatividade

Neste período, alguns trabalhos referentes aos fenômenos radioativos já estavam bem desenvolvidos.

Sabia-se por exemplo que a radiação alfa (α) possuía carga positiva.



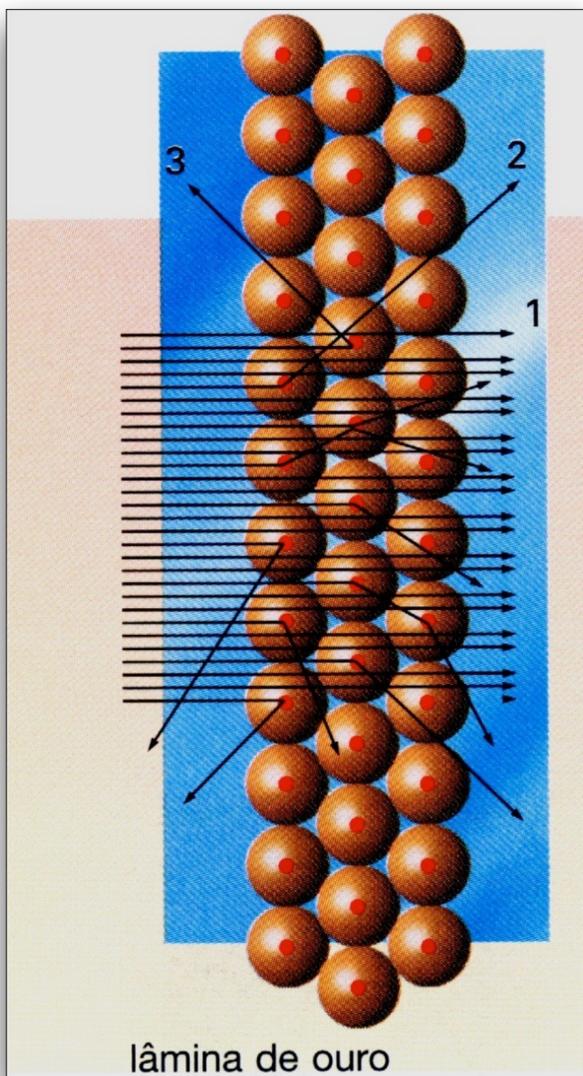
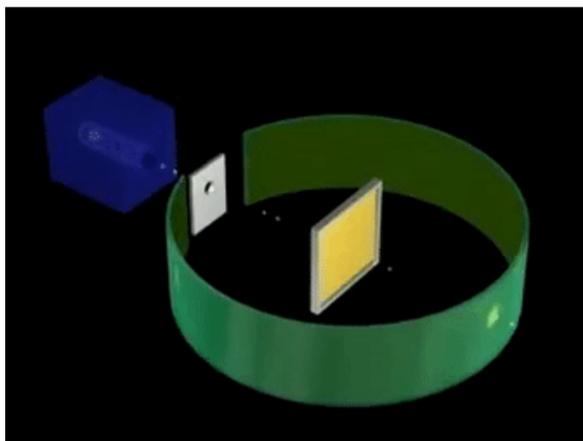
Bombardamento da lâmina delgada de ouro



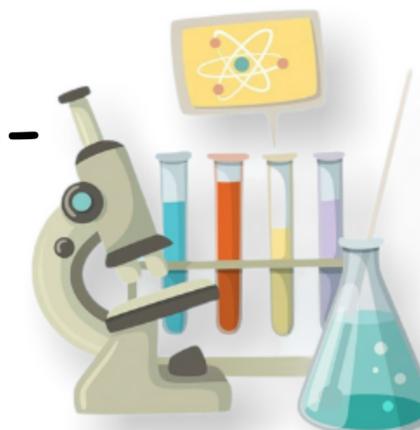
© Clube da Química

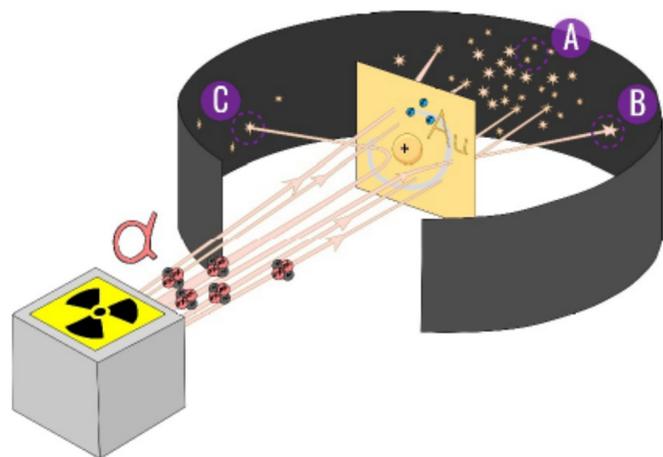


Prof: Alex

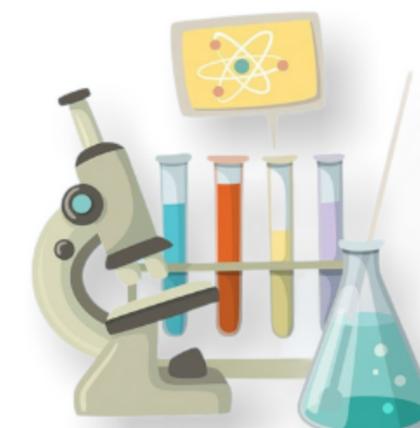
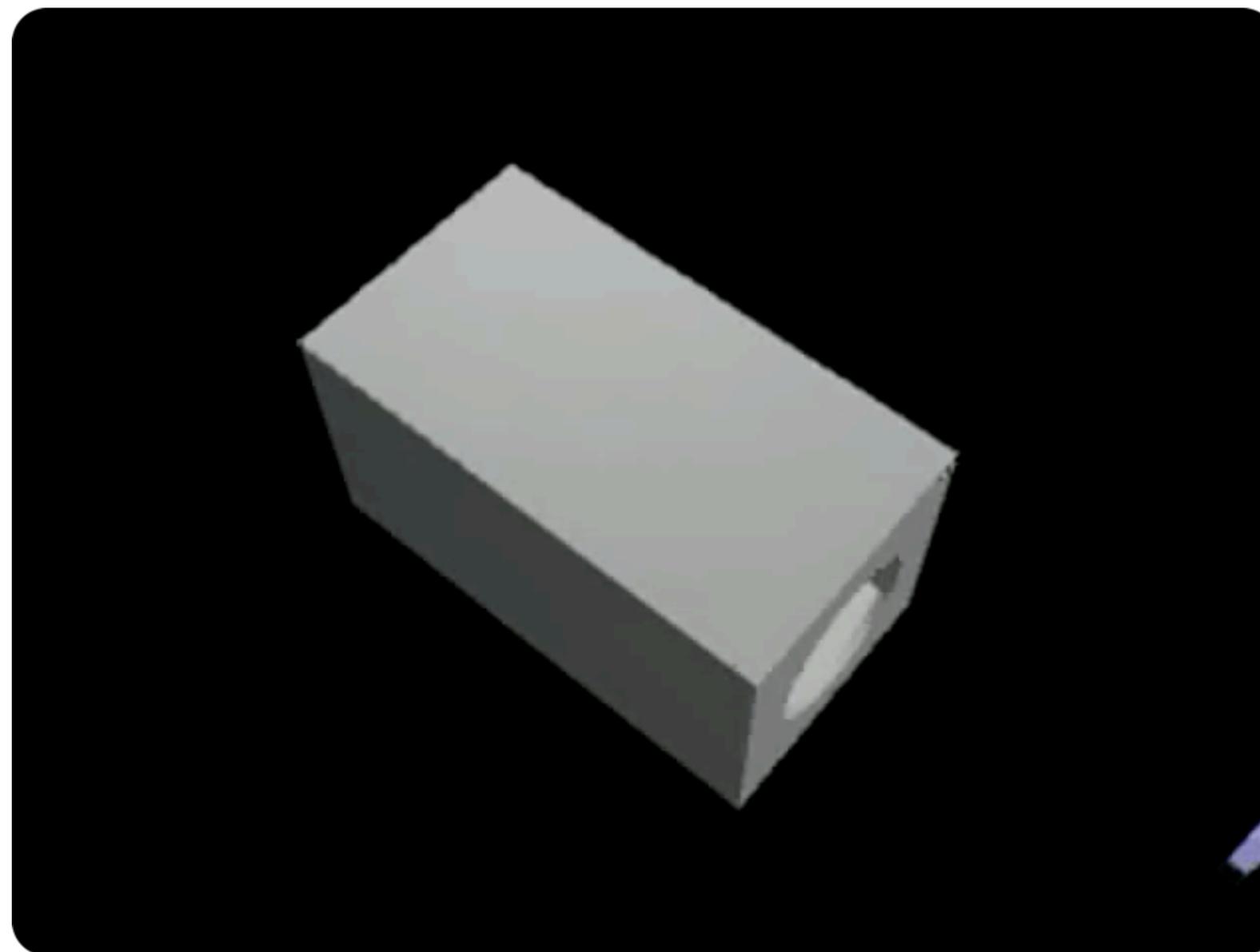


- ☑ **1**-Parte da radiação atravessou sem sofrer desvios, passando provavelmente por uma região vazia.
- ☑ **2**-Parte da radiação sofreu desvios pequenos pela repulsão do núcleo.
- ☑ **3**-Parte da radiação recocheteou, chocando-se frontalmente com o núcleo.

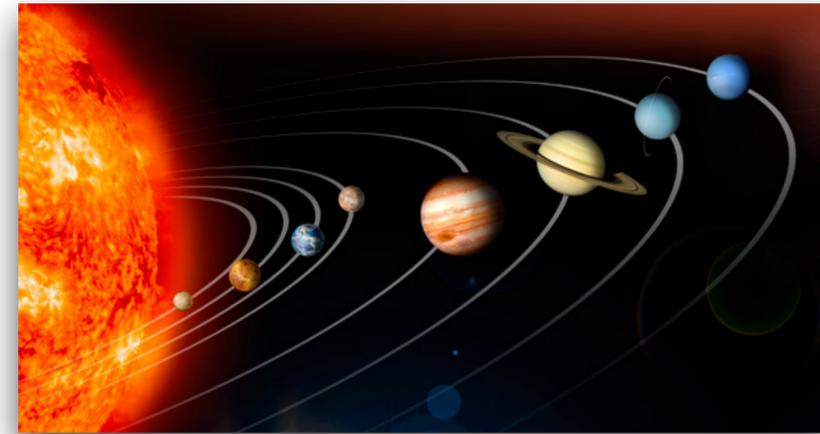
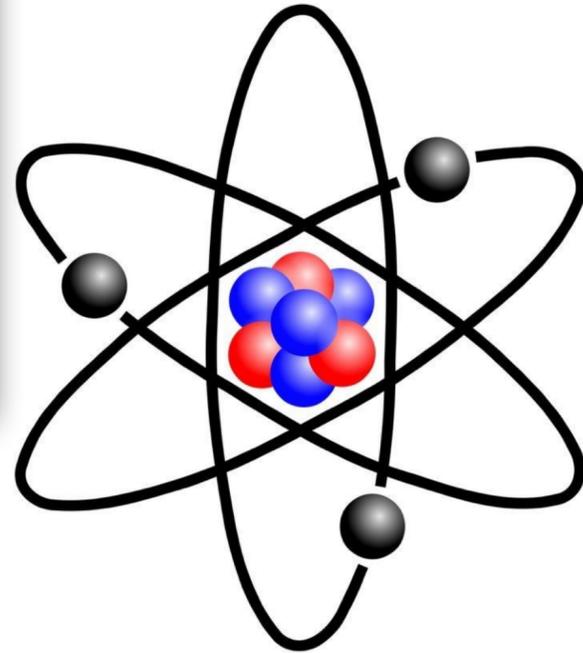
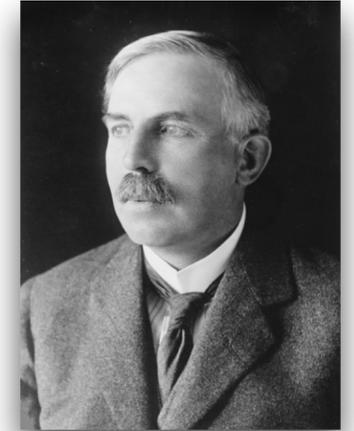




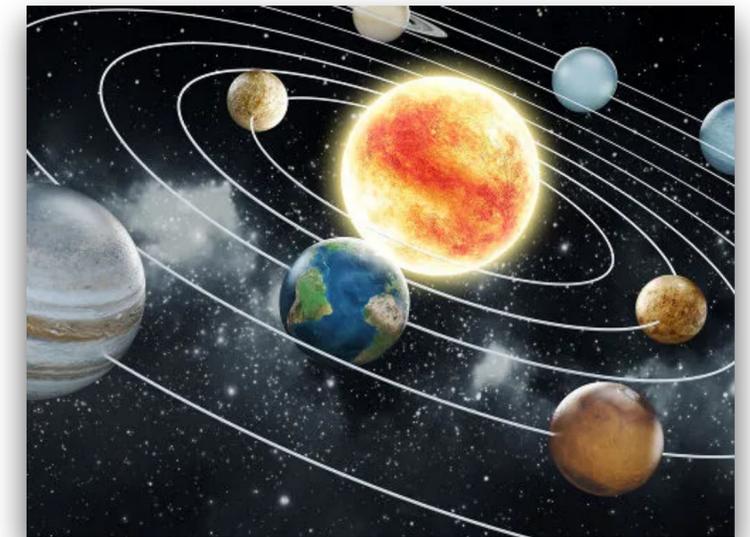
Vídeo: *A experiência*



Modelo de Rutherford (1911)



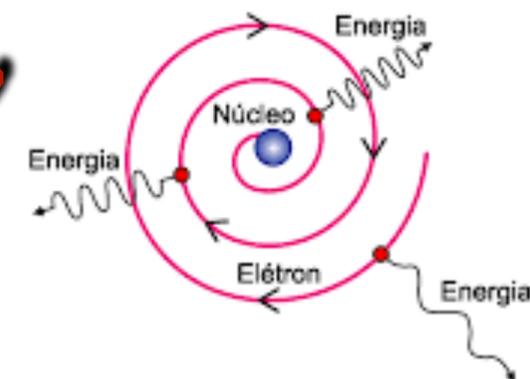
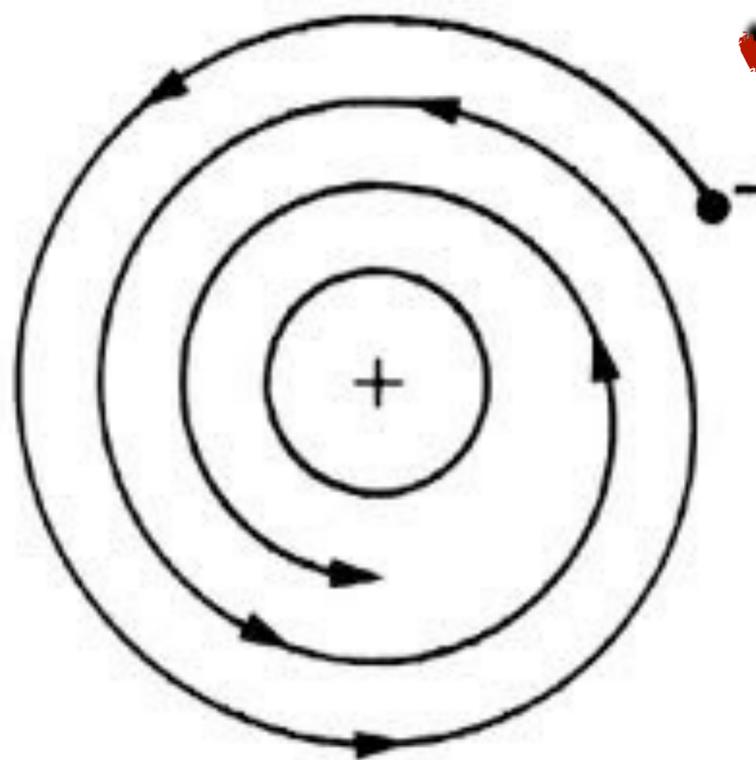
“Sistema Planetário”



- O átomo é formado por duas regiões distintas.
- O núcleo, pequeno, maciço e de carga positiva.
- A eletrosfera, bem maior, repleta de espaços vazios e de carga negativa. Onde movimentam os elétrons.



"Colisão do elétron"

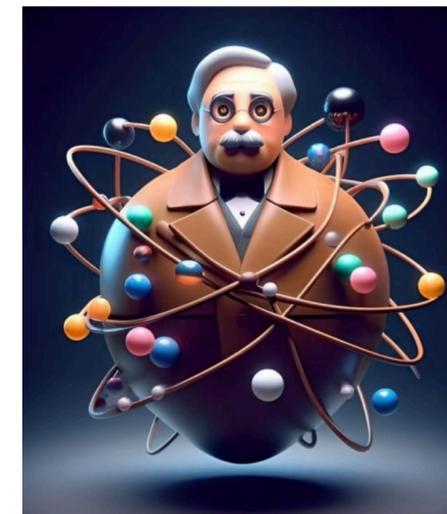
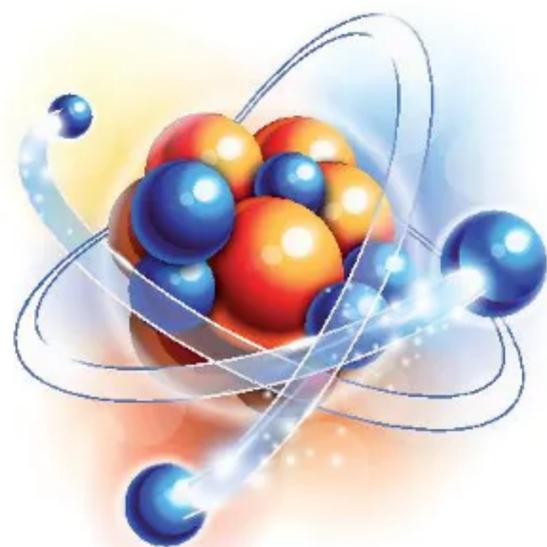


De acordo com as leis da física clássica:
"Uma partícula carregada dissipa energia durante seu movimento".

Ao associar essa constatação ao Modelo de Rutherford, o elétron deveria desacelerar até colidir com o núcleo. Uma inconsistência entre as leis da física, na época, e o modelo proposto.



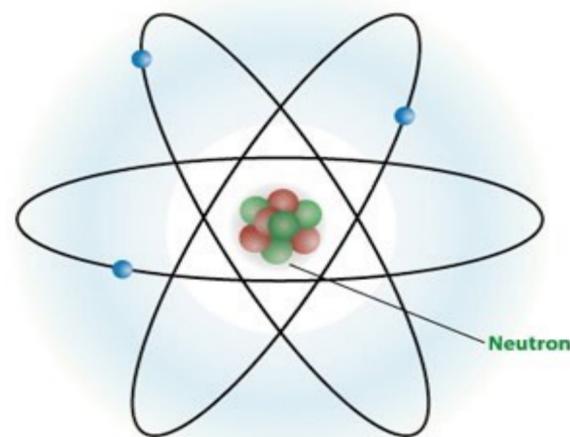
Características e destaques do modelo



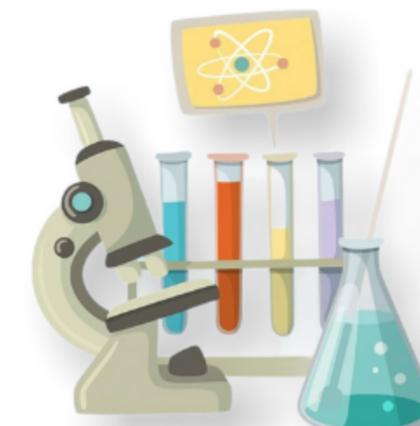
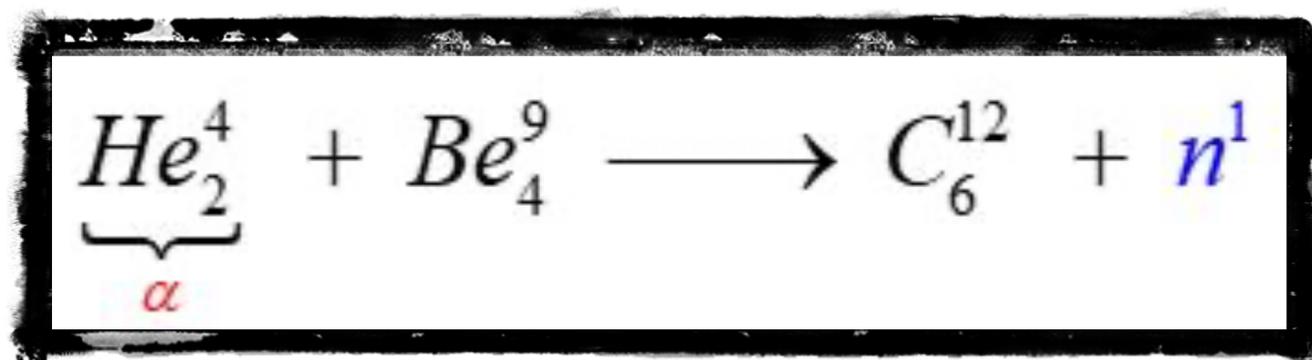
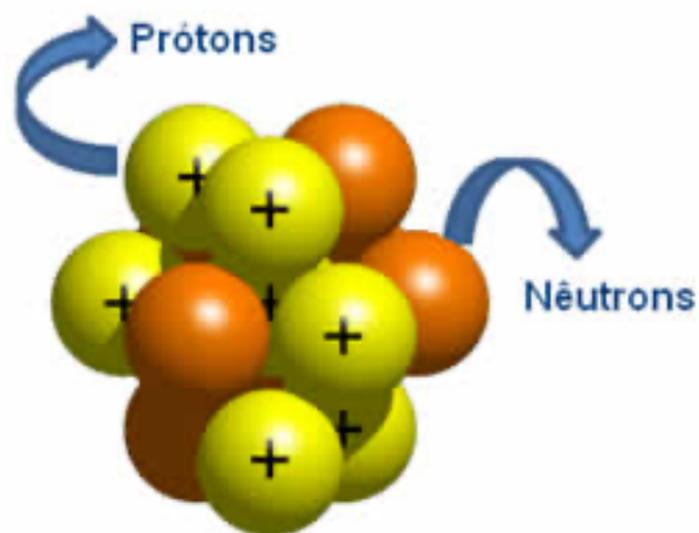
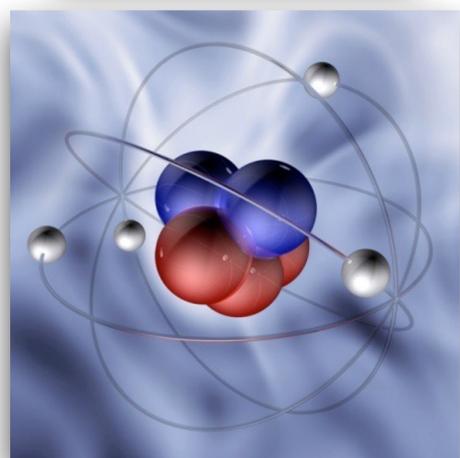
- O átomo passa a ser heterogêneo, com duas regiões bem definidas.
- A matéria é, em sua maior parte, um grande vazio.
- A descoberta do núcleo, que futuramente passaria a ser a explicação para os fenômenos radioativos.



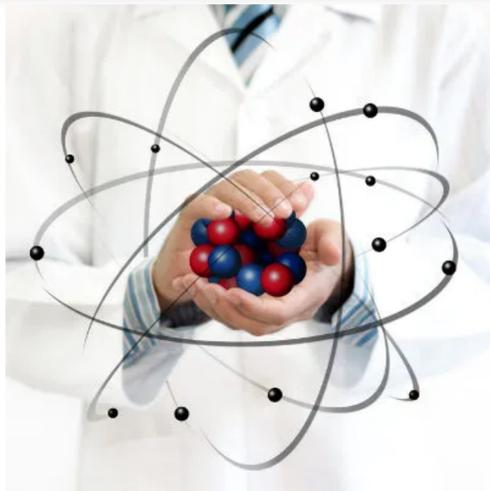
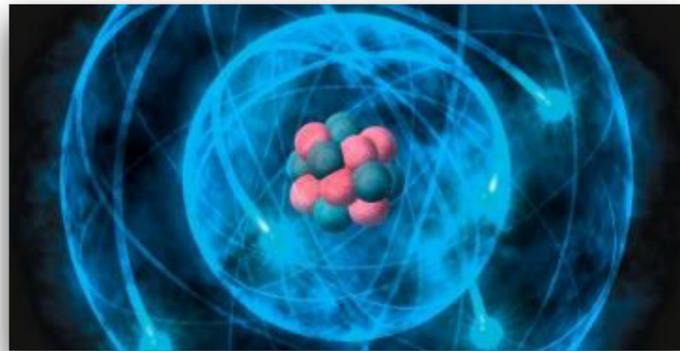
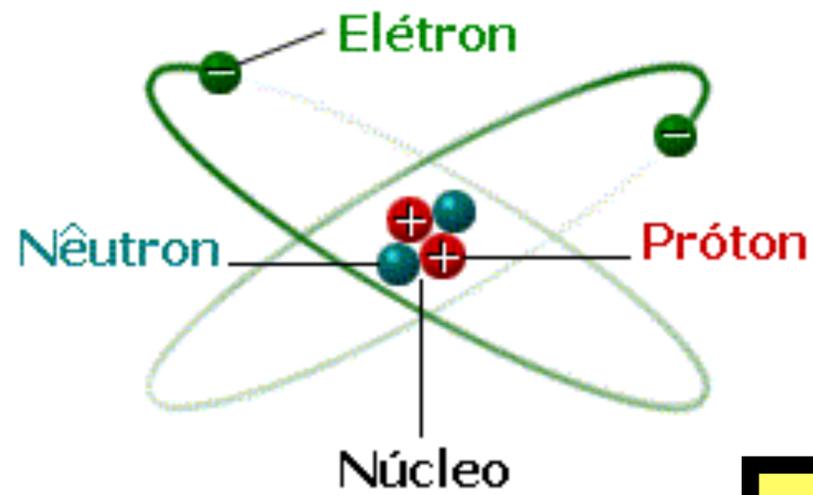
A descoberta do nêutron



O nêutron foi descoberto em 1932 por James Chadwick, usando o princípio da conservação do movimento no bombardeamento de uma amostra de berílio com radiação alfa.



Partículas Importantes

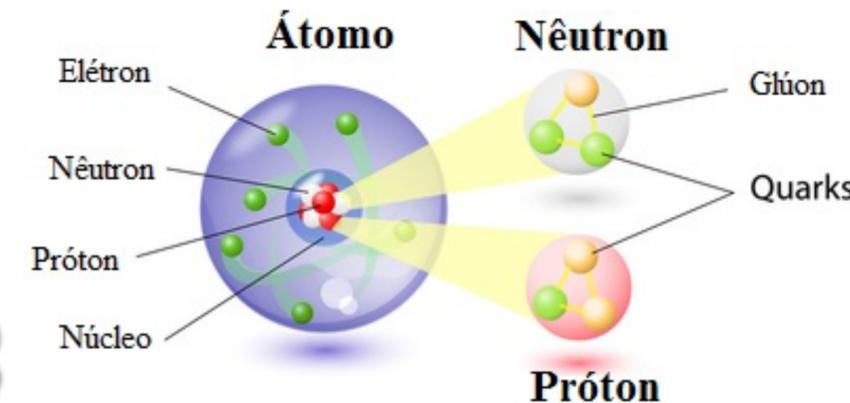


Partículas Fundamentais	Massa relativa	Carga relativa
Próton	1	+1
Nêutron	1	0
Elétron	1/1836	-1





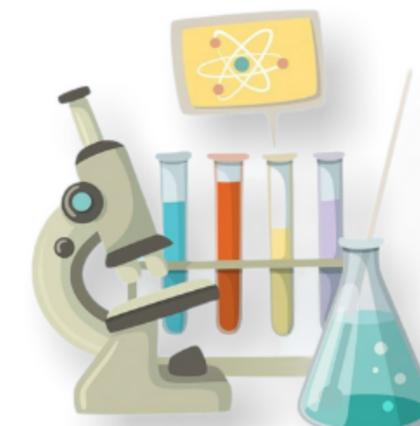
Partículas Elementares



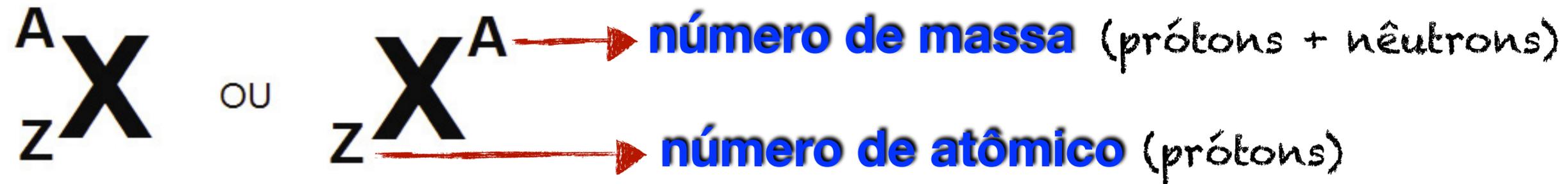
Partículas que não possuem nenhuma subestrutura.

De acordo com os físicos, as partículas atômicas elementares estão em três categorias: os **quarks**, **léptons** e **bóson**:

- Os quarks dão origem a partículas pesadas como os prótons e neutrôns. Os léptons são partículas leves como os elétrons.
- Os bósons são "partículas" sem massa que propagam as forças do Universo.



Representação do Átomo



EX:



$p=11$

$n=12$

$e=11$



$p=55$

$n=82$

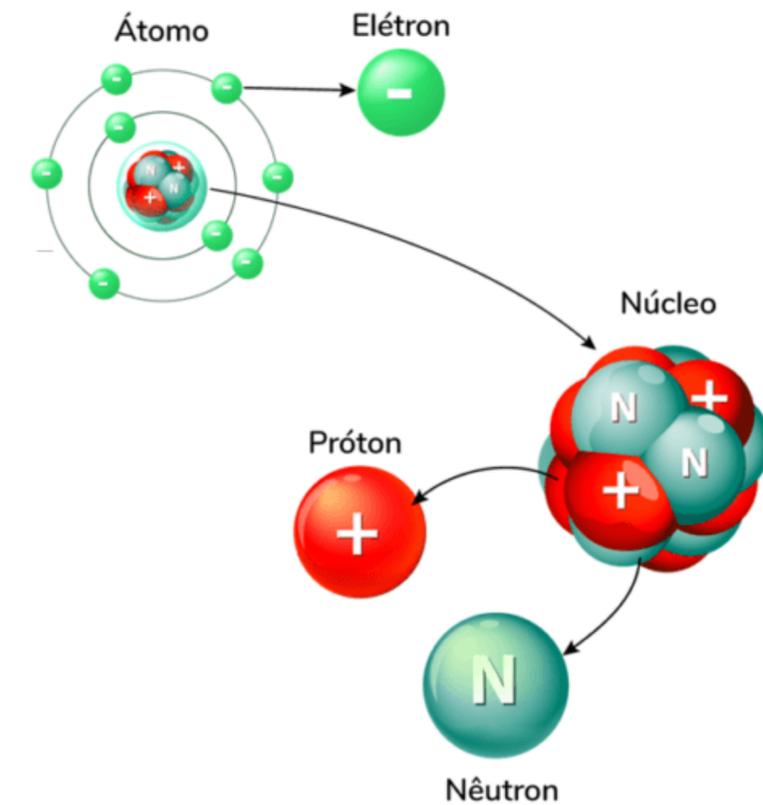
$e=55$



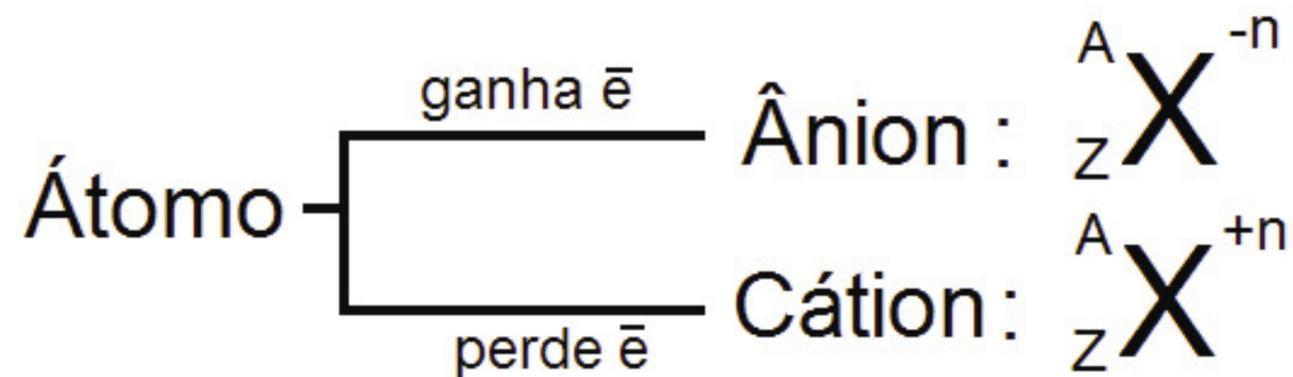
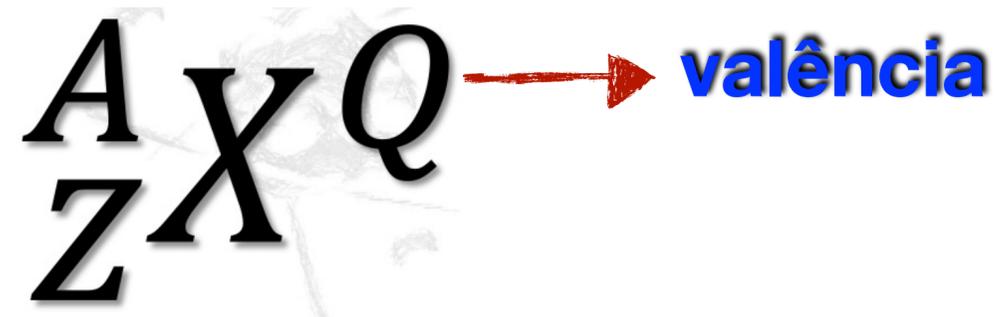
$p=20$

$n=20$

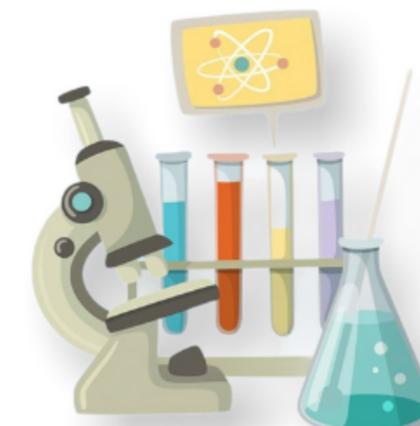
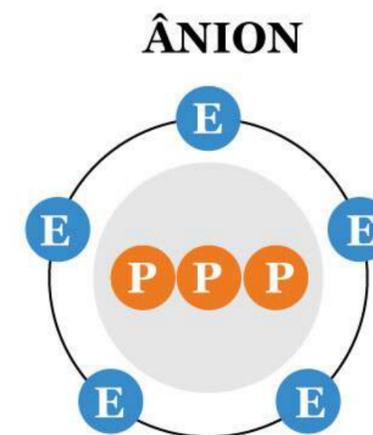
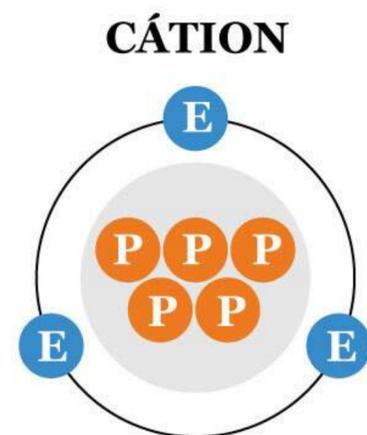
$e=20$

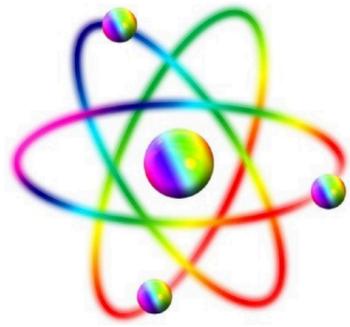


Representação do Íon



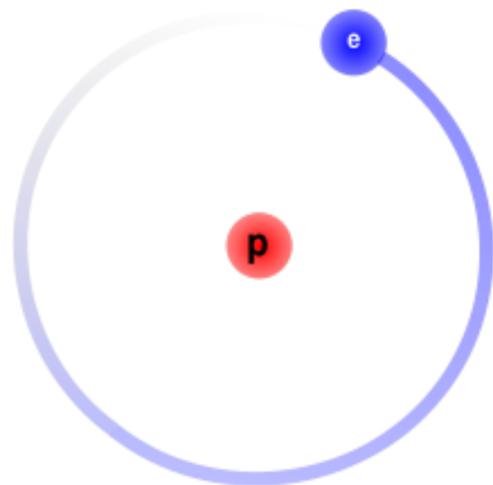
EX:



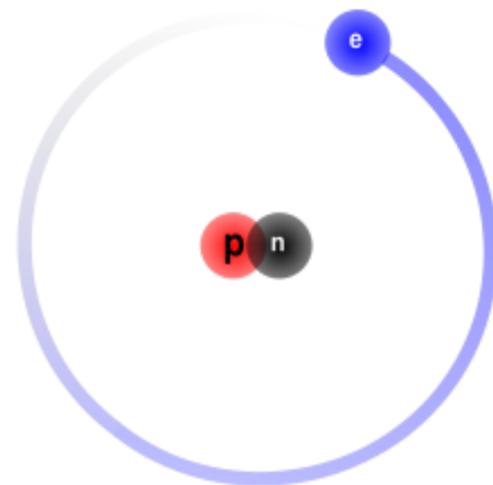


Isótopos

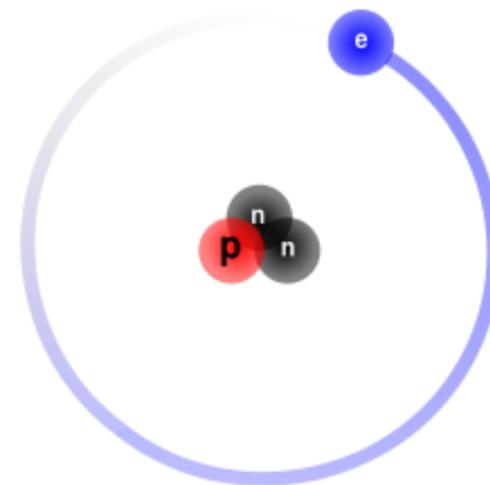
Isótopos são átomos de um mesmo elemento químico que apresentam o mesmo valor do número atômico, mas se diferem no número da massa.



${}^1_1\text{H}$
Prótio

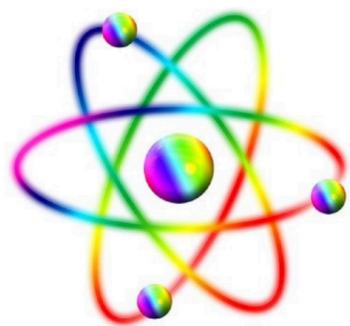


${}^2_1\text{H}$
Deutério



${}^3_1\text{H}$
Trítio





Isóbaros

Isóbaros são átomos que possuem o mesmo número de massa (A), mas diferentes números atômicos (Z).

EX:

40

40

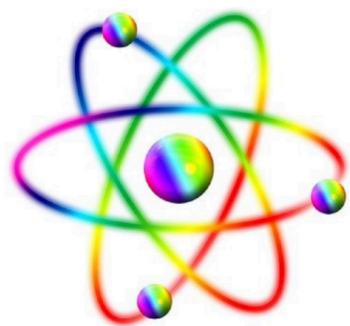
Ca

Ar

20

18

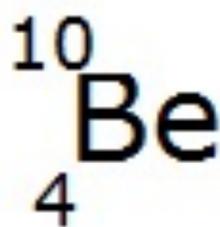




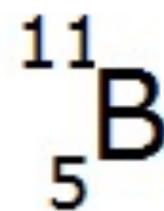
Isótonos

Isótonos são átomos que possuem o mesmo número de nêutrons, mas diferentes números atômicos (Z) e de massa (A).

EX:

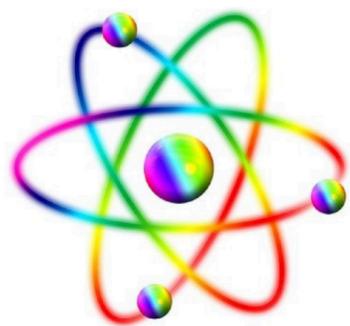


$$n=6$$



$$n=6$$





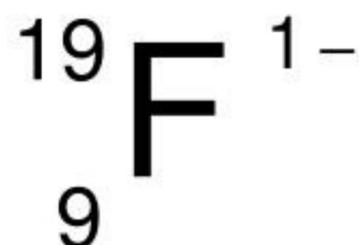
Isoeletrônicos

Isóeletrônicos são átomos ou íons, de elementos diferentes, que possuem o mesmo número de elétrons.

EX:



e=10

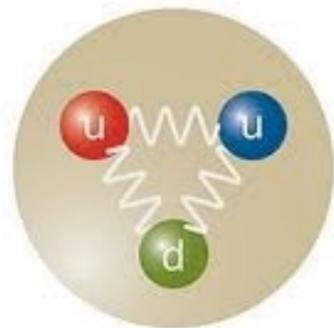


e=10

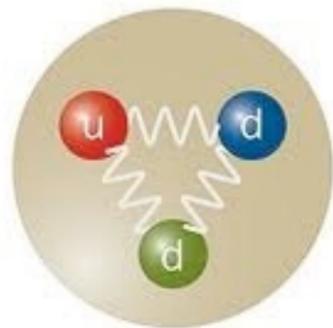


e=10





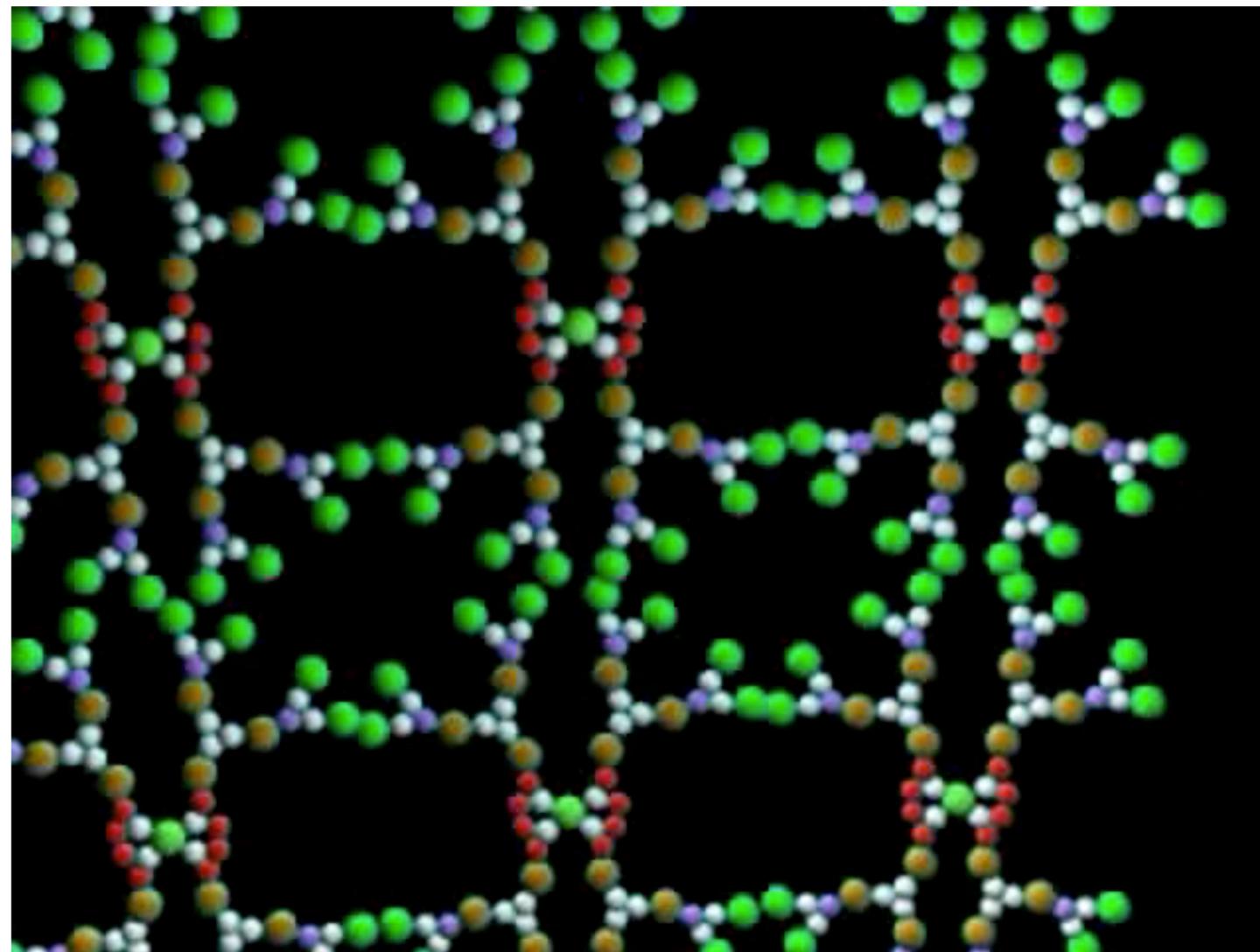
Proton



Neutron

Os quarks

(VÍDEO)



acesse o canal

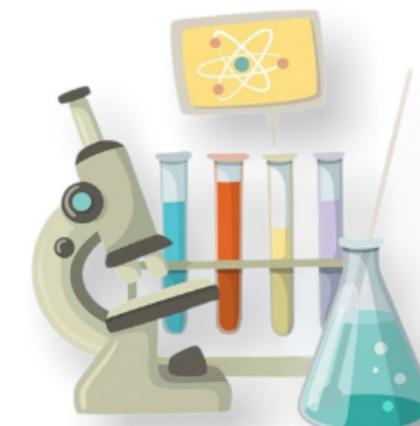


Prof: Alex

Vídeo: **Rutherford**



acesse o canal



Prof: Alex

A experiência de Rutherford hoje...

(VÍDEO)

It's 100 years since Ernest Rutherford
'discovered' the atomic nucleus.



acesse o canal

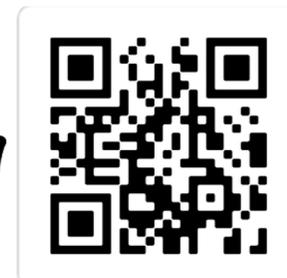


Prof: Alex

Faça uma revisão...

(VÍDEO)

A 3D periodic table of elements is shown against a dark background. The elements are color-coded by groups: alkali metals (green), alkaline earth metals (light green), transition metals (grey-blue), metalloids (yellow), nonmetals (orange), noble gases (red), lanthanides (light blue), and actinides (purple). The table includes elements from Hydrogen (H) to Oganesson (Og), with the lanthanide and actinide series shown as separate rows below the main body.



acesse o canal

