

Inside atoms - the Rutherford experiment

☞ Questions to start with

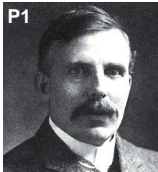
1. Remember the particle model of atoms. Which object from real life would you take as a model of a hydrogen atom and which as a model of a carbon atom?

2. Draw inside the boxes gold atoms in the three states of matter:

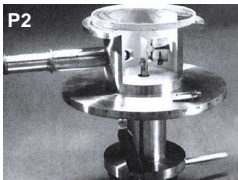
solid	liquid	gaseous

3. Imagine you had a piece of gold foil. What would happen if you took some small balls and shot them against the foil?

Rutherford's experiment



Ernest Rutherford
1871 - 1937



Between 1909 and 1911 **Ernest Rutherford** (P1) carried out experiments which changed the scientists' view on the nature of atoms.

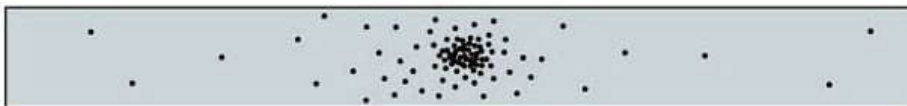
Rutherford took a piece of thin gold foil. He placed the flat foil into the middle of an apparatus shown in P2. The inside walls of the apparatus were covered with photographic film. Through a lens Rutherford shot a special kind of radiation, so-called "α-particles", which are positively charged, against the gold foil. After the experiment he made two observations:

1. The gold foil had not changed at all.
2. The photographic film had the pattern shown in P3

Folie

Strahlung
geladen

Muster



P3 The developed photographic film after Rutherford's experiment. The middle of the film was situated opposite the lens.

☞ Work with a partner:

What can you conclude about the nature of the gold atoms?

schlussfolgern

Try to find an answer that explains

- a) why some α-particles could move right through the foil as if there had not been anything in their way
- b) why some α-particles are reflected and bounce back
- c) why some α-particles were deflected at large angles

zurückprallen
abgelenkt, Winkel