

Electron shells

Extract from "Advanced chemistry for you", Lawrie RYAN, Nelson Thornes

1. Read the text and tell me if there are words you do not understand.

Amount = quantity

Handheld = hold by the hands

2. Questions about the text:

(Le cours sur les spectres a déjà été vu en français)

How did Niels Bohr explain the lines in atomic spectra?

→ Lines in atomic spectra should correspond to certain amounts of energy (either given out or absorbed)

When energy is given out, we see a coloured line (if it is visible) and when energy is absorbed, we see a black line.

What do you need to see an atomic spectrum?

→ We need a spectroscope.

What are the 2 ways of exciting an atom?

→ We can excite an atom by a flame (heat) or by an electrical discharge (in a discharge tube).

What happens to an electron when exciting an atom?

→ When an atom is excited, it gains energy and it causes an electron to jump up to a higher energy level.

What happens to the atom when the electron falls back?

→ When the electron falls back, the atom releases energy under the form of light.

What is n called?

→ n is called the principal quantum number, it corresponds to the number given to the energy level.

What is a quantum?

→ A quantum is a fixed quantity of energy.

Find in the text a phrase that means the energy of an atom is quantified.

→ "Electrons in an atom could only have certain fixed energies"

To which extent did Bohr modify the Rutherford's model?

→ In Rutherford's model, electrons move around the nucleus without any particular trajectory whereas in Bohr's model, electrons can only be found on particular shells.

What are the rules for filling the shells?

→ The electrons fill up the energy levels from the middle outwards.

→ They occupy the lowest energy level possible.

What did Bohr's model succeed in explaining that Rutherford's model could not?

→ Bohr's model succeeded in explaining the lines in atomic spectra.

3. Conclusion: what is the relation between the lines in an atomic spectrum and the energy levels in an atom?

(Compréhension générale du document)

When we see a coloured line in a spectrum it means that an electron has fallen back from a higher energy level to a lower one: the particular amount of energy between both levels gives the colour to the line.