

Question

Do atoms in a period fill a different last main energy level?

Answer:

Since the one energy level is determined as the set of orbitals with the same principal quantum numbers (main quantum number (n) and orbital quantum number (l)), the answer may be given as follows.

In the first period elements (H and He) fill the same last energy level ($n=1, l=0$ (s-orbitals)). So the first period is the only period wherein elements fill the same energy level (answer **no** to the question)

In other periods, elements fill different energy levels (answer **yes** to the question), although some of elements of a period fill the same energy level. Namely, the elements of 1st and 2nd groups in each period fill the same energy level ($l=0$ (s-orbitals)) and the elements of 13th – 18th groups in each period fill the same energy level ($l=1$ (p-orbitals)). In 4th and 5th periods the elements of 3rd – 12th groups and in 6th and 7th periods the elements of 4th – 12th groups fill the same energy level ($l=2$ (d-orbitals)). In 6th and 7th periods the elements of 3rd group fill the same energy level ($l=3$ (f-orbitals)).