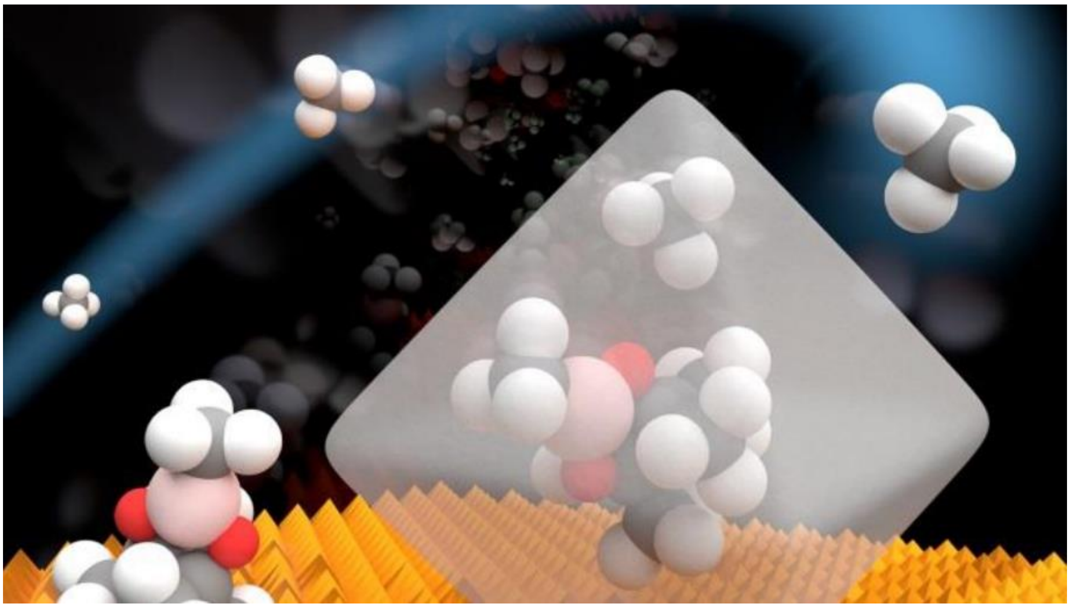
Isotope theory (hypothesis)



Isotopes are varieties of atoms of the same chemical element that have the same atomic number, but different masses. What surprises us is that one element can have a large number of isotopes.

The initial elements of the periodic table may differ, often by only one nucleon (potassium and calcium, for example) or may even have the same number of nucleons (calcium and argon) and, at the same time, be very different from each other. And here - the same element can have up to 10 isotopes and stay yourself at the same time. For example, calcium can have from 40 to 48 nucleons and remain the calcium.

This, of course, can be explained classically: all isotopes have the same number of "valence" electrons responsible for external bonds. But, the role of electrons, which are thousands of times smaller than nucleons, is somehow greatly exaggerated.

Isotopes are detected using mass spectrometers, in which a stream of elementary nuclei passes through electrical deflector plates (magnetic deflector plates). It is believed that the charge of the nucleus is the same for all isotopes. Consequently, nuclei with a larger mass, as more inert, will be deflected more weakly by the deflecting plates of the electric field.

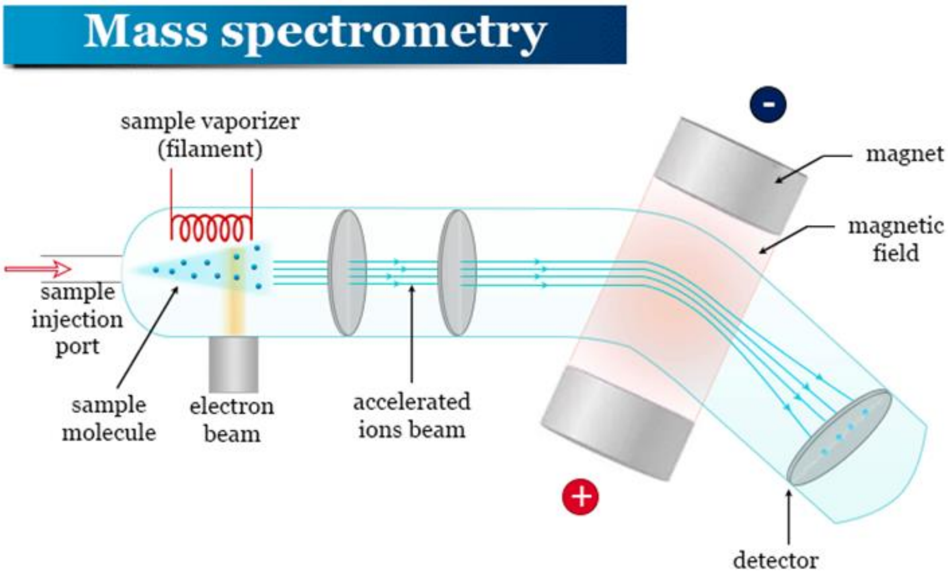


Fig.1

I have a hypothesis that, in fact, the nucleus of any chemical element has only one, unique and unique configuration. And the different weight of its “isotopes” is explained by its spatial asymmetry, different angles, so to speak, sides under which it flies through the mass spectrometer plates.

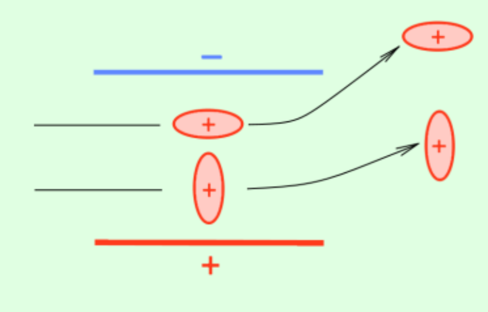


Fig.2

It was shown above that electric forces, as well as all others, have a gravitational nature. Large particles - nucleons, are attracted to smaller particles - electrons, but not because some have a positive charge while others have a negative one. There are no electric charges - there are different sizes of elementary particles! Particles of the same size are repelled, particles of different sizes are attracted.

Thus, the force acting on a nucleus flying between the plates depends on its foreshortening, on its area "visible" to the deflecting plates of the spectrometer.The upper particle in Fig.2 has a larger area facing the spectrometer plates than the lower particle. Therefore, it is, shall we say, more "positive" than the lower one and, therefore, will be more deflected upward.

Work was carried out to determine such an area of the nuclei under all their possible foreshortening. Moreover, more attention was paid to the elements with the most contrasting percentage of isotopes (for greater clarity and credibility). For this, photographs of these nuclei were taken from a sufficient height (for the parallelism of the projection rays). Then, the area bounded by the contour of the projection of the nucleus was determined. For example, projections of only two positions of the same nucleus are shown by Fig.3.

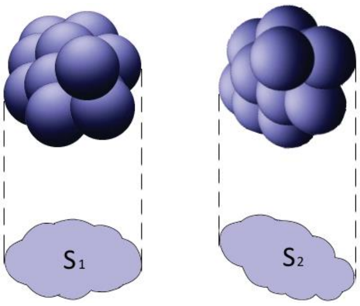


Fig.3

The areas of all possible projections of the nucleus were determined in the same way. For a sphere, such a distribution will represent a vertical line (whatever one may say - the projection is the same). For a shape close to a sphere, namely, an ellipsoid or an ovoid, the distribution of projections is divided into two groups: equal or unequal.

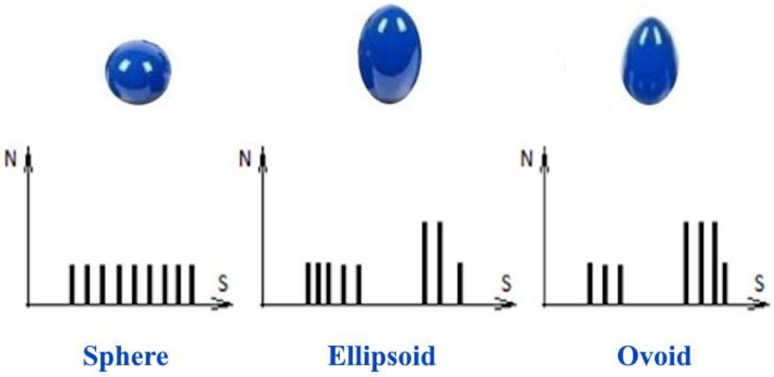


Fig.4

If you look at the table of isotopes, you can see that elements with odd ordinal numbers either have no isotopes at all, or have two isotopes with approximate distributions: 50/50, 60/40, 70/30.

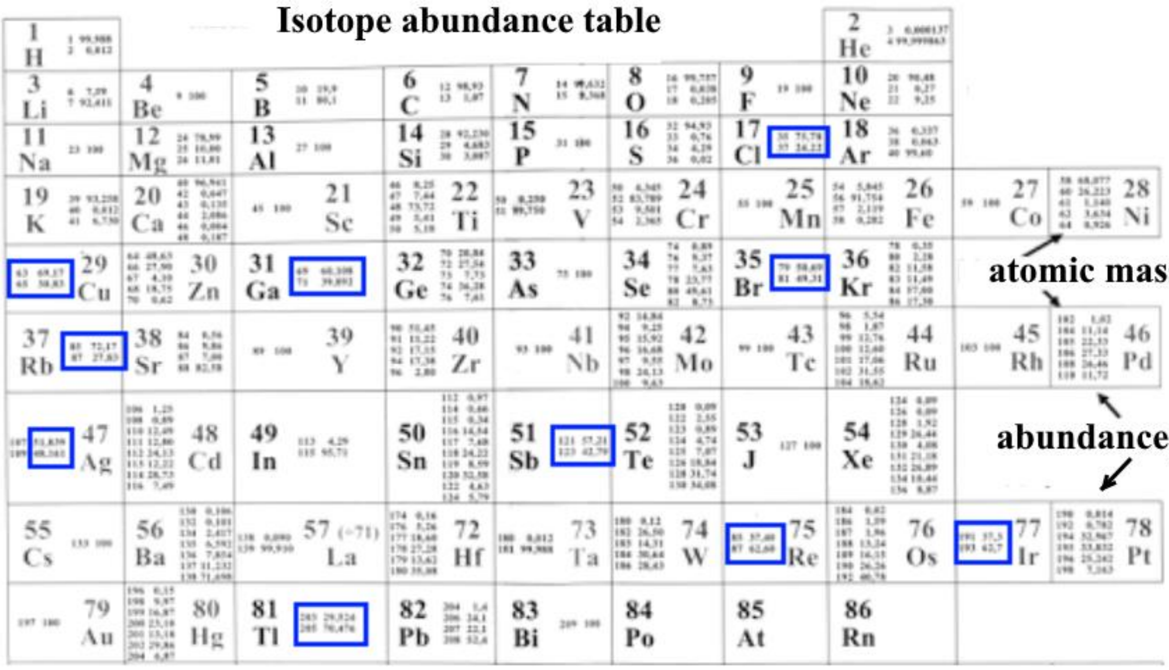


Fig.5

But these, after all, are the distributions of our three types of spherical nuclei. And, in fact, when sculpting these odd elements, these are the shapes that emerge. Everything is simple with these spherical nuclei, but what about nuclei that have up to ten isotopes with a wide variety of percentages?

Fig.6 shows a histogram, where the x-axis is the area of the nucleus projection (**S**), and the ordinate is the frequency of occurrence of this area (**N**) for the nucleus of a boron atom with two isotopes **B10** (20% prevalence) and **B11** (80%)

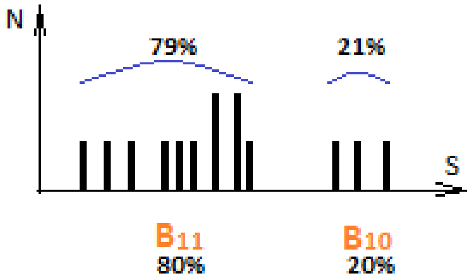


Fig.6

Two groups of area distributions are clearly visible at different foreshortening of the boron nucleus. Their frequencies of occurrence (79% and 21%), which corresponds to the percentage of occurrence of these isotopes in nature. Why do we only say "corresponds"?

The point is that a larger area of the nucleus corresponds to a larger electric charge. When the nucleus has such a large area facing the spectrometer plates, it deflects more strongly (Fig.2). In classical spectrometry, a stronger deflection of the nucleus is interpreted in such a way that this nucleus has a lower mass (the charge of the nucleus, after all, in the classics it is assumed to be the same for all isotopes). That is why a larger area corresponds to an isotope with a lower mass.

The boron atom has a simple isotope distribution. What about more complex atoms? Yes, exactly the same. Look at the histogram of the areas of zinc nuclei and see for yourself!

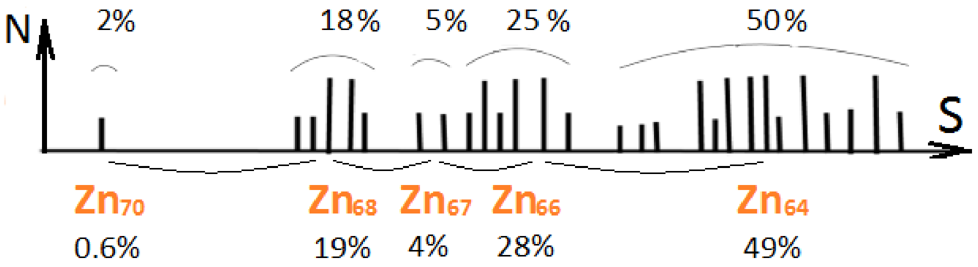


Fig.7

Below the graph is the percentage of isotopes in nature, and above the graph is the percentage distribution of the areas of these nuclei. Moreover, there is another coincidence here. Adjacent isotopes have a weight difference of 1 or 2 **AMU** (**70-68-67-66-64**). In the same way, the centers of neighboring groups of areas are separated from each other by corresponding distances (see lengths of the lower arcs).

Thus, there are no five zinc isotopes with different masses, but there are five characteristic foreshortening of the zinc nucleus.