

The Stability and Radioactivity of Atomic Nucleus

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Abstract: put the causes and mechanism for unstable atomic nucleus has radioactivity

Main Viewpoint & Result

A Deuterium's nucleus is composed of one proton and one neutron, which two protons and one π -meson, [1] is stable; the nucleus of Helium-3 is composed of two protons and one neutron, which three protons and one π -meson, is stable; a Tritium's nucleus is composed of one proton and two neutrons, which three protons and two π -mesons, is unstable, and its half-life is about 12.32 years, then it decays into Helium-3.

But, since a Tritium's nucleus contains only one proton, there is no existence the Coulomb repulsion between of protons inside of the Tritium's nucleus, it shows that the Coulomb repulsion between of protons is not the reality causes for atomic nucleus in unstable state and has radioactivity.

The reality causes for the Tritium's nucleus in unstable state and has radioactivity is: compared with a stable Helium-3, a Tritium's nucleus has a redundancy π -meson and excess energy, until freed the redundancy π -meson and excess energy, after decays into Helium-3 by π decay, and $\pi = e^- (\beta) + \nu (\gamma)$, reaches stable state.

In short, atomic nucleus' energy is produced by neutrons and their π -mesons, the energy levels of atomic nucleus is determined by N/A , or $(A-Z)/A$, one kind of nuclide has radioactivity, is because it containing redundancy neutrons, or more accurately, is because it containing redundancy π -mesons and excess energy. [2]

The process that element discharged from unstable nucleus spontaneously rays (such as α -rays, β -rays, γ -rays, etc.), and the decay of the element formation in stable state, is the process that release of the redundancy π -mesons and the excess energy.

Also precisely because the energy and energy levels of atomic nucleus are determined by the $(A-Z)/A$, employ the *Neutron excitation*, namely, by neutrons emission, Injection (conveying; load) neutrons into the target nucleus, making the target nucleus obtains extra neutrons and redundancy π -mesons, into unstable state, and then has radioactivity, to produce of radioactive substances is widely used in the medical sector, academia and the industrial.

References

[1]The Basic Structure and Properties of Hadrons <http://vixra.org/abs/1407.0015>

[2] π -Meson and the Structure of a Nucleus <http://vixra.org/abs/1405.0228>