

What are the three types of radioactive decay?

Original Text

The three primary types of radioactive decay are:

1. **Alpha Decay**: In alpha decay, an unstable nucleus emits an alpha particle, which consists of two protons and two neutrons (essentially a helium-4 nucleus). This process decreases the atomic number by 2 and the mass number by 4, leading to the formation of a new element.
2. **Beta Decay**: Beta decay can occur in two forms:
 - **Beta-minus decay**: In this process, a neutron in the nucleus is transformed into a proton, an electron (beta particle), and an antineutrino. The electron is ejected from the nucleus. This increases the atomic number by 1 but does not change the mass number.
 - **Beta-plus decay** (or positron emission): Here, a proton is converted into a neutron, a positron (the electron's antiparticle), and a neutrino. The positron is emitted from the nucleus. This decreases the atomic number by 1 but does not change the mass number.
3. **Gamma Decay**: Gamma decay occurs when an excited nucleus releases energy in the form of gamma rays, which are high-energy photons. This type of decay does not change the number of protons or neutrons in the nucleus but brings the nucleus from an excited state to a lower energy state.

These decay processes are fundamental in nuclear physics and play crucial roles in various applications, including medical imaging, radiometric dating, and energy production in nuclear reactors.

Perturbed Text

The three primary types of radioactive decay are:

1. **Alpha Decay**: In alpha decay, an unstable nucleus emits an alpha particle, which consists of two protons and one neutron (essentially a helium-3 nucleus). This process decreases the atomic number by 2 and the mass number by 4, leading to the formation of a new element.
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