

NUCLEAR DECAY Worksheet

1. What is an alpha particle? What are the changes that take place when an alpha particle is expelled?
2. What is a beta particle? What happens when beta decay takes place?
3. What is gamma radiation?
4. In which forms of nuclear decay does the identity of the atom change?
5. Arrange these forms of radiation from most penetrative to least - alpha, beta, gamma.

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Answers

1. What is an alpha particle? What are the changes that take place when an alpha particle is expelled?

An alpha particle is similar to a helium-4 atom and is made up of 2 protons and 2 neutrons. When an alpha particle is emitted, or alpha decay takes place, 2 neutrons and 2 protons are lost.

2. What is a beta particle? What happens when beta decay takes place?

A beta particle, also referred to as beta radiation or beta rays, is a particle emitted at high energy. It is similar to an electron, though it can be both positively or negatively charged. A positron is a positively charged beta particle.

As there are two types of beta decay - β^- decay and β^+ decay - the results vary. When β^- decay occurs, a particle identical to an electron is emitted, while β^+ decay leads to the emission of a positron.

3. What is gamma radiation?

Gamma radiation is an electromagnetic radiation known for its high penetration and similarity to X-rays.

4. In which forms of nuclear decay does the identity of the atom change?

In alpha and beta decay, the atom's identity changes as the atomic number changes in both cases. In the case of gamma radiation, only energy is expelled and no other changes take place.

5. Arrange these forms of radiation from most penetrative to least - alpha, beta, gamma.

Gamma → Beta → Alpha

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