NUCLEAR REACTIONS ALPHA BETA GAMMA

INTRODUCTION: An atom in the process of breaking down can give off alpha particles, beta particles, and gamma rays. Alpha particles consist of two protons and two neutrons, identical to a helium nucleus. The beta particle, or electron, comes from the nucleus as the neutron breaks down into a proton and an electron. The beta particle is tossed out along with some of the binding force that held the neutron together which is pure energy also know as gamma rays. All three kinds of radiation ionize the air around them.

MATERIALS: seven marbles of one color or type for protons, eight marbles of a second color or type for neutrons, one marble of a third color or type, shallow container

PROCEDURE:

1. Place six proton marbles and eight neutron marbles in the container. This represents the radioactive form of a common element. Give the name of the element, the atomic number and the atomic mass of this isotope.

2. Remove enough protons and neutrons to represent an alpha particle. Give the name of the element that remains in the container, the atomic number and the atomic mass.

3. When radiation is given off, one element actually changes into another element of nearly the same size. This process is called radioactive decay. A different kind of radioactive decay takes place when an atom gives off a beta particle. Place a marble of a third color outside the container to represent that beta particle and a bit of energy that has been given off. Remove one of the neutron marbles and replace it with another proton marble. Give the name, atomic number and atomic mass of this element.

4. Which kind of radiation does carbon 14 actually give off to stabilize? Explain why it occurs in this way?