7.1 Types of Radiation

Who first identified the 3 most common types of radiation?

_____

_____ particles: positively charged atomic particles. They consist of 2 protons and 2 neutrons. They are the most massive type of radiation particle.

_____ particles move quite slowly. As a result,

they don't penetrate things very well. A _____ stops an alpha particle.

The greek letter alpha looks like this: _____

So our symbol will be: _____

It has the same number of protons and neutrons as most

_____ atoms so sometimes it is written like a

_____ atom: _____

Because an alpha particle has 2 protons and no electrons, alpha

particles have a _____ charge.

When alpha decay occurs, the original atom loses 2 protons (and 2 neutrons). *As a result, it becomes a*

_____

Example equation:

_____

_____ particles: a _____ particle is an electron. It has some mass but not a lot.

_____ particles move more quickly than alpha. As

a result they have _____ penetrating power.

The greek letter beta looks like this: _____

So our symbol will be_____

Wait a minute! Why does an electron have an atomic number of -1? It's because the electron is "created" by breaking down a neutron into a proton and an electron (beta decay). The proton stays in the nucleus, changing the atomic number and making the

atom something new. Ex: Iodine becomes _____!

Because beta particles are electrons, they have a _____ charge.

Example equation

_____

_____ particles: a _____ particle is high energy, short wavelength radiation. It is not really "made" of any type of particle.

_____ radiation is super high energy, so it has the greatest penetrating power of all forms of radiation. It can

penetrate most things. A dense substance (like _____

or _____) will eventually stop it, but it needs to be thick enough (several cm thick).

The greek letter gamma looks like this: _____

So our symbol will be _____

Gamma radiation does not involve the removal of any particles, so

the atomic number and atomic mass will_____.

Gamma radiation is not made of any particles, so there isn't any_____.

If a particular atom is "extra energized" (that is, it has absorbed a lot of energy) it will sometimes release that energy as gamma

radiation. We use the symbol _____ to indicate an atom with that extra energy.

Example equation:

_____

Gamma decay can also happen without that extra energy:

_____

A chemical equation for a nuclear reaction is called a nuclear equation. It follows the same rules as chemical equations such as:

1.

_____

(law of conservation of mass)

2.

_____

(see total atomic number)