Name: _____ Date: _____

Notes: Nuclear Chemistry

alpha particle (α) = $^{4}_{2}He$ beta particle (β) = $^{0}_{-1}e$ neutron = $^{1}_{0}n$

How many ***protons*** are in an alpha particle? _____

How many ***neutrons*** are in an alpha particle? _____

What is the ***charge*** of an alpha particle? _____

How do alpha particles compare to other forms of radiation in terms of their mass?

_____

Are α particles the *most* or *least* penetrative radiation? _____

Are α particles the *most* or *least* ionizing radiation? _____

Why are alpha particles such a highly ionizing form of radiation?

_____

β particles have the same properties of what other particles? _____

What is the **charge** of a beta particle? _____

What changes in the nucleus when a β particles is emitted?

_____

Do beta particles have any mass at all? _____

What do we round the mass of β particles to because they are so small? _____

What can be used to stop beta radiation? _____

Why are beta particles considered a slightly ionizing form of radiation?

_____

What are gamma rays? _____

What is the **charge** of gamma radiation? _____

What is the *actual* mass of gamma radiation? _____

What must be used to stop gamma radiation? _____

Why are gamma rays considered a *non-ionizing* form of radiation?

_____

How does the *energy* and *frequency* of gamma rays compare to other EM radiation?

_____

What is true of ***both*** fission and fusion? _____

_____

How does the *amount* of mass relate to *amount* of energy created in nuclear reactions?

_____

Define ***fission***: _____

Are fission reactions easy or difficult to initiate? _____

How do we use fission reactions? _____

What is a drawback of fission? _____

Define ***fusion***: _____

Why would fusion be such a great energy source for producing electricity? _____

_____

Why is fusion not used to directly produce electricity? _____

_____

What type of reaction, fission or fusion, occur inside stars like our sun? _____

$$^{14}C \rightarrow {}^{0}_{-1}e + \_\_\_\_\_$$

Balancing Nuclear Reactions

Step 1: _____

Step 2: _____

Step 3: _____