

Name: _____

Date: _____

Notes: Nuclear Chemistry

alpha particle (α) = ${}^4_2\text{He}$ beta particle (β) = ${}^0_{-1}\text{e}$ neutron = ${}^1_0\text{n}$

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? _____

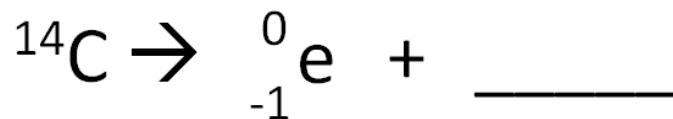
What is a drawback of fission? _____

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? _____



Balancing Nuclear Reactions

Step 1: _____

Step 2: _____

Step 3: _____