Chemistry
Ms. Ye

Name _____
Date _____Block _____

Writing Nuclear Decay Equations: *Write the chemical equation for each of the following nuclear decay reactions*

1. Alpha decay of Astatine-209

2. Beta Decay of Potassium – 40

3. Beta Decay of beryllium-7

4. Alpha decay of Oxygen-19

5. Alpha decay of At-212

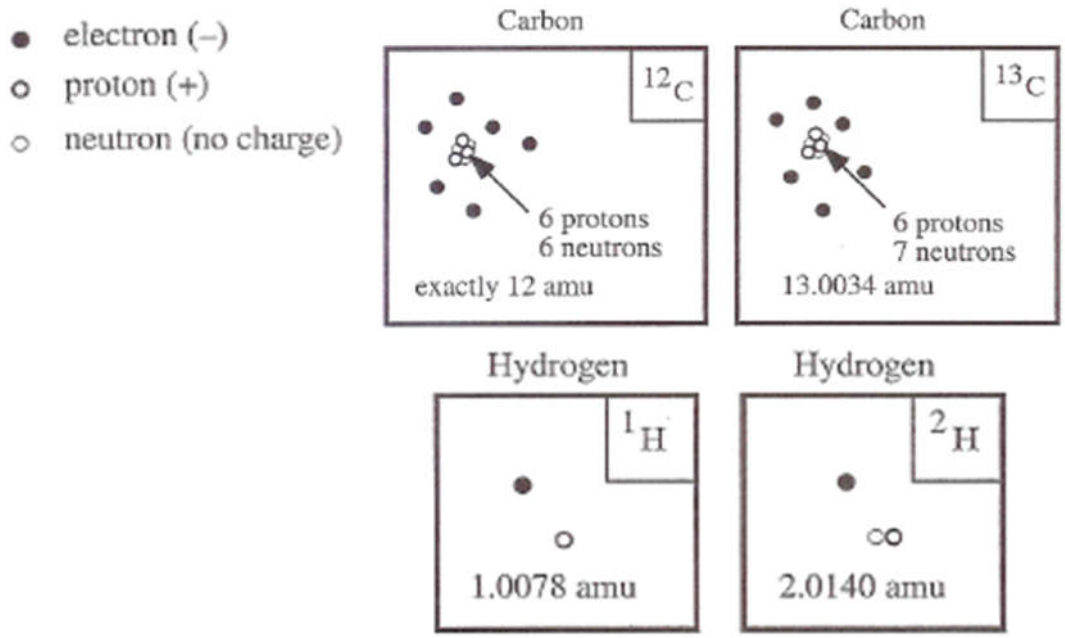
6. Hg-202 (β)

7. Beta decay of Hs-260

8. Fr-230 (α)

Nuclear Stability

Isotopes



- Isotopes of the same element have the same number of _____ and different number of _____

Nuclear Reaction…

- involves a <u>decay</u> in the <u>nucleus</u> of an atom.
- occur because the nucleus of an atom is <u>unstable</u>

Let's take a closer look inside the nucleus of atoms…(use notes to fill in this part)

- There are 2 subatomic particles in the nucleus:

  _____ + _____

  - Protons have a _____charge, whereas neutrons have _____ charge.
  - **As atomic # increases**…
    - the # of protons _____,
    - & nuclear charge _____
    - This causes more <u>REPULSIONS</u> within the nucleus.
  - <u>Neutrons</u> help _____ by _____ the repulsive forces between protons

Complete the following table and then answer the questions that follow.

Isotope	# neutrons	# protons	# electrons	n/p ratio	Stable/unstable
H-3	**2**	**1**	**1**	$\frac{2}{1} = \mathbf{2}$	Unstable
He-4					stable
C-12					Stable
C-14					Unstable
K-39					Stable
K-42					Unstable
Mn-54					Unstable
Zn-75					Stable
Co-60					Unstable
Au-197					Stable
Po-210					Unstable
Cm-250					Unstable
U-235					Unstable

1. Do the number of electrons affect the stability of the nucleus? Explain.

2. Using the shaded portions of the table above, complete the table below

Atomic Number range	**1 to 19**	**20 to 83**	**84 and above**
Ratio of n/p for stable isotopes			

PRACTICE:

1. What happens to isotopes that do not fall within the band of stability?

2. For each isotope, calculate the N/P ratio and decide if it should be stable or unstable.

Isotope	# of Protons	# of Neutrons	N/P ratio	Stable or Unstable?
boron-13				
magnesium-24				
calcium-40				
zinc-75				
tin-127				
terbium-159				
mercury-200				