Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_Hr\_\_\_\_\_\_\_\_\_

**Isotopes and Ions Practice Worksheet**

1. Use models to support the claim that isotopes of the same atom exist. Provide labels and provide a definition for isotope.
2. In grammatically correct sentences, explain how a sulfur atom (S) can become a sulfur ion (S-2). Explain how the two are different. Explain how they are similar.
3. Here are three isotopes of an element:
   1. The element is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. The number 6 refers to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. The numbers 12, 13, and 14 refer to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. How many protons and neutrons are in the first isotope? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. How many protons and neutrons are in the second isotope? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. How many protons and neutrons are in the third isotope? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Complete the following chart:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Symbol** | **Isotope name** | **charge** | **Atomic #** | **Mass**  **#** | **# of protons** | **# of neutrons** | **# of electrons** |
|  | Uranium-235 | 0 |  |  |  |  |  |
| +2 |  |  | 92 | 238 |  |  |  |
|  |  |  |  |  | 5 | 5 |  |
|  | Boron-11 |  |  |  |  |  | 5 |

1. What is the charge on an ion with 21 protons, 25 neutrons, and 18 electrons?
2. Naturally occurring europium (Eu) consists of two isotopes with a mass of 151 and 153. Europium-151 with a mass of 150.9196 amu has an abundance of 48.03% and Europium-153 with a mass of 152.9209 amu has an abundance of 51.97%. What is the average atomic mass of europium?
3. Strontium consists of four isotopes with masses of 84 (abundance 0.50%), 86 (abundance of 9.9%), 87 (abundance of 7.0%), and 88 (abundance of 82.6%). Calculate the average atomic mass of strontium.
4. An element has the following isotopes. Find its average atomic mass and name the element.

|  |  |
| --- | --- |
| Mass (amu) | Abundance (%) |
| 203.973 | 1.40 |
| 205.974 | 24.10 |
| 206.976 | 22.10 |
| 207.977 | 52.40 |

1. There are three stable isotopes of Argon: Argon-36, Argon-38, and Argon-40. What would the atoms of these isotopes have in common? What would be different about their atoms?

ADVANCED PRACTICE:

1. Element X has an average atomic mass of 200.59amu. There are two naturally occurring isotopes for element X. One isotope has a mass of 202.34amu and the other has a mass of 198.77amu. Determine the percent abundance for each isotope of element X.