**Radioactivity Worksheet**

1. **State the number of neutrons and protons in each of the following nuclei:**
   1. : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. The three types of radioactive emissions are alpha (α), beta (β), and gamma (δ)

radiation. **Complete the table using the correct information about each type**.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Charge** | **Atomic Symbol** | **Can Be Stopped By** |
| Alpha |  |  |  |
| **Beta** |  |  |  |
| **Gamma** |  |  |  |

1. **Which of the three radioactive emissions (α , β, δ) best fit the following statements?** Write the correct symbol/s on the lines.
   1. These emissions are charged. \_\_\_\_\_\_\_\_\_\_\_\_
   2. This emission is the most massive (heaviest). \_\_\_\_\_\_\_\_\_\_\_\_
   3. This emission is the most charged. \_\_\_\_\_\_\_\_\_\_\_\_
   4. This emission is most dangerous outside of the body. \_\_\_\_\_\_\_\_\_\_\_\_
   5. This emission is stopped by thin paper or a few centimeters of air. \_\_\_\_\_\_\_\_\_
   6. This emission can travel through paper, but is stopped by aluminum. \_\_\_\_\_\_\_
   7. This emission can travel through fairly thick lead. \_\_\_\_\_\_\_\_\_\_\_\_
2. **Which type of radiation – alpha, beta, or gamma:**
   1. Results in the greatest change in atomic number? Why?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Results in the least change in atomic number? Why?

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* 1. Produces the greatest change in mass number? Why?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Produces the least change in mass number? Why?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In a paper-making factory, beta radiation is used to check that the paper being produced is the correct thickness. If the paper gets too thin, the reading on the detector increases causing the rollers to move apart to make the paper thicker. If the paper gets too thick, the reading on the detector goes down causing the rollers to move closer together. A diagram of this set-up is shown below:

detector

source

rollers

paper

**Explain why beta radiation is used for this procedure rather than alpha or gamma radiation.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_

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