

UNIT 1: TUTORIAL 3 : RADIOACTIVITY

1. The three types of radioactive emissions are called alpha (α), beta (β) and gamma (γ) radiation. Complete the table below with the correct information about each type.

	Charge	Atomic Symbol
Alpha		
Beta		
Gamma		

2. Which of the three radioactive emissions (α , β , γ) best fit the following statements? Write the correct symbol/s on the lines.

- a) These emissions are charged. _____
- b) This emission is heaviest. _____
- c) This emission is the most charged. _____
- d) This emission is stopped by thin paper or a few centimeters of air. _____
- e) This emission can travel through paper, but is stopped by aluminum. _____
- f) This emission can travel through fairly thick lead. _____

3. Which type of radiation – alpha, beta, or gamma:

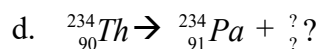
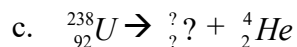
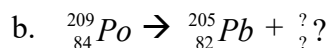
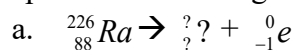
- a. Results in the greatest change in atomic number? Explain why.

- b. Results in the least change in atomic number? Explain why?

- c. Produces the greatest change in mass number? Explain why?

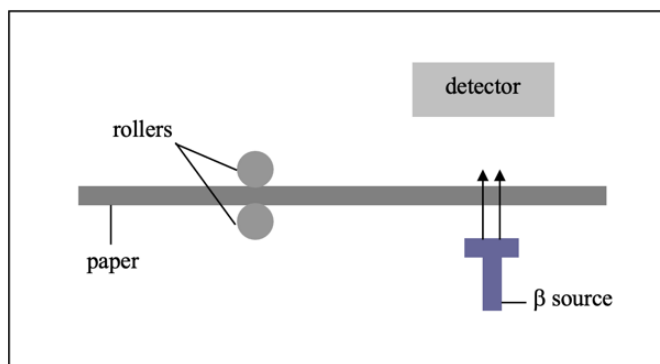
- d. Produces the least change in mass number? Explain why?

4. Complete the following nuclear reactions:



5. When isotope Bismuth-213 (Number of protons = 83) emits an alpha particle: Write out the nuclear equation: (Number of protons in Au=79, Hg=80, Tl=81, Pb=82, Po=84)

6. In a factory paper-making, beta radiation is used to check that the paper being produced is the correct thickness. If the paper is 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:



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