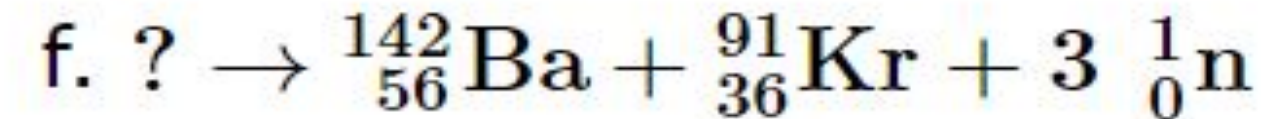
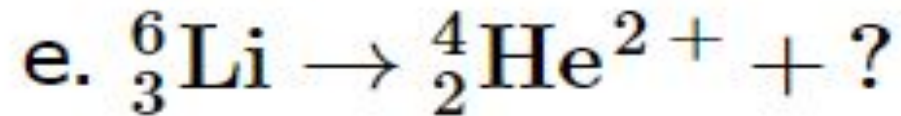
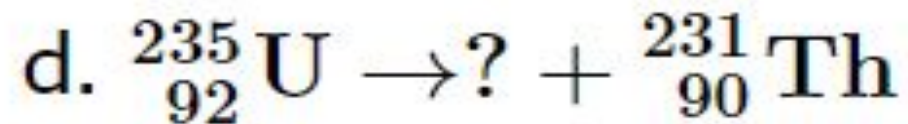
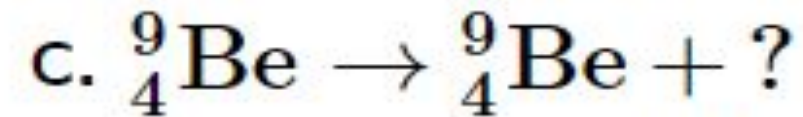
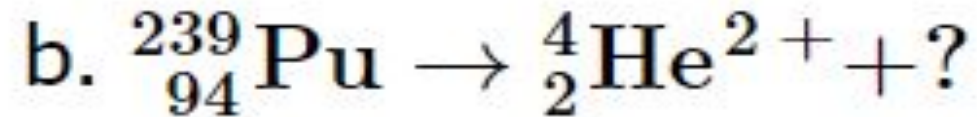
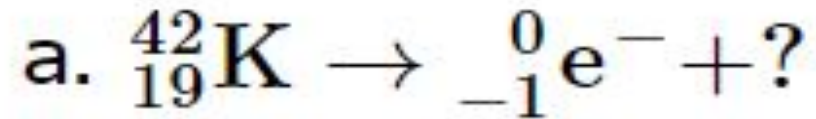


# Mark – scheme for RADIOACTIVITY quiz:

1. Delta.
2. True
3. Gamma
4. Alpha particles
5. **Beta decay** (*Radioactive decay that emits energetic electrons is called beta decay. Beta decay comes in two varieties.  $\beta^-$  decay involves normal, negatively-charged electrons , while  $\beta^+$  decay involves positively-charged electrons or positrons. The energetic electrons or positrons are called beta particles in this context.*)
6. Alpha decay

## Q2: Complete the following nuclear equations (the question marks)



# Pre-lesson activity:

- What is the atomic mass?
- Why we do not use the absolute atomic mass?
- How the relative atomic mass was calculated?
- What is the value of *amu*?
- Why the atomic masses in the periodic table are not necessarily whole numbers?

**Theme of the lesson**

**Atomic mass**

# Learning objectives

- ✓ Calculate relative atomic, molecular and formula masses.
- ✓ Explain why the atomic masses in the periodic table are not necessarily whole numbers.
- ✓ Calculate relative isotopic ratios from molar mass.

# Success criteria

## *Student achieves if*

- ✓ He/she will be able to calculate relative atomic, molecular and formula masses
- ✓ He/she can explain why the atomic masses in the periodic table are not necessarily whole numbers
- ✓ He/she will be able to calculate relative isotopic ratios from molar mass

**The relative atomic mass is calculated using the equation:**

$$A_r = \frac{(\% \text{ of Isotope 1} \times \text{mass of Isotope 1}) + (\% \text{ of Isotope } n \times \text{mass of Isotope } n)}{100}$$

So in the case of chlorine:

$$A_r = \frac{(25\% \times 37) + (75\% \times 35)}{100} = 35.5$$

**Task 1.** Calculate the relative atomic mass of oxygen if its absolute atomic mass is equal to  $26.67 \times 10^{-27}$  kg

**Task 2.** What is the absolute atomic mass of sulfur atom?

**Task 3.** Calculate the average relative atomic mass for next isotopes of given elements:

- 69.2%  ${}^{63}_{29}\text{Cu}$  and 30.8%  ${}^{65}_{29}\text{Cu}$
- 50% of  ${}^{79}_{35}\text{Br}$  and 50% of  ${}^{81}_{35}\text{Br}$

**Task 4.** It is possible to do the reverse of a relative atomic mass calculation if you know the  $A_r$  which isotopes are present. (It involves a little bit of arithmetical algebra.) The  $A_r$  of boron is 10.81 and consists of only two isotopes, boron-10 and boron-11. Calculate the % composition of isotopes MS