

Complete the following chart.

Element/ion	Atomic Number	Atomic mass	Mass number	protons	neutrons	electrons
V	23	50.95	51	23	51-23=28	23
Na ⁺	11	22.99	23	11	12	10
³⁵ ₁₇ Cl ⁻	17	35.45	35	17	18	18
²⁵ ₁₂ Mg ²⁺	12	24.31	25	12	13	10
As ³⁻	33	74.92	75	33	42	36
¹⁰⁷ Pd	46	106.42	107	46	61	46
S ²⁻	16	32.07	32	16	16	18
U	92	238.03	238	92	146	92

1. Explain the difference between atomic mass and mass number.

atomic mass: decimal, weighted average of all isotopes
 mass number: whole number, protons + neutrons for a specific isotope

2. An anion has a negative charge. A cation has a positive charge.

3. What happens to the electrons when an atom becomes an anion? gain more electrons

4. What happens to the electrons when an atom becomes a cation? lose electrons

Calculate the atomic mass for the following elements using the weighted average method. Answer to two decimal places.

5. 93.3% Potassium 39, 6.7% Potassium 41.

$$\begin{aligned} 0.933 \times 39 &= 36.387 \\ 0.067 \times 41 &= 2.747 \end{aligned} \left. \vphantom{\begin{aligned} 0.933 \times 39 \\ 0.067 \times 41 \end{aligned}} \right\} 39.134 = 39.13 \text{ amu}$$

6. 78.7% Magnesium 24, 10.13% Magnesium 25, 11.17% Magnesium 26.

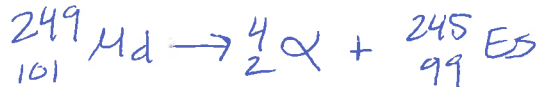
$$\begin{aligned} 0.787 \times 24 &= 18.888 \\ 0.1013 \times 25 &= 2.5325 \\ 0.1117 \times 26 &= 2.9042 \end{aligned} \left. \vphantom{\begin{aligned} 0.787 \times 24 \\ 0.1013 \times 25 \\ 0.1117 \times 26 \end{aligned}} \right\} 24.3247 = 24.32 \text{ amu}$$

Nuclear Chemistry

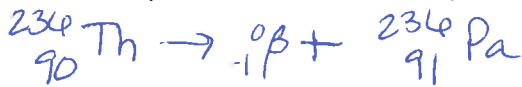
7. Write the symbols for each of the types of decay. α $-\beta$ γ

8. Transmutation happens when an atom changes from one element to another. Which types of decay result in transmutation? alpha & beta

9. Write the equation for the alpha decay of Mendeleevium 249.



10. Write the equation for the beta decay of Thorium 236.



11. What does "metastable" mean? unstable Which type of decay uses "metastable" to signify a change? gamma

12. Draw a picture (or two) explaining the difference between fission and fusion.

