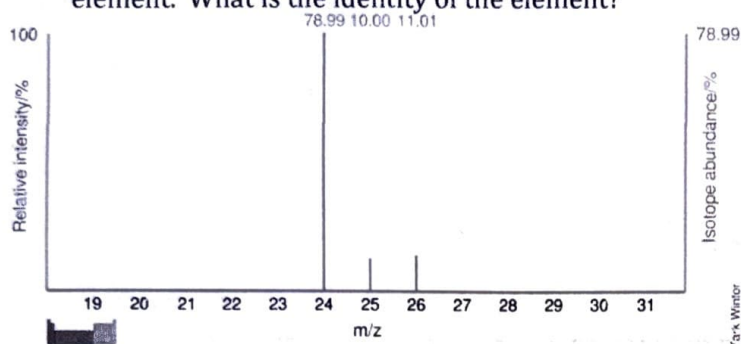


**YOU DO:**

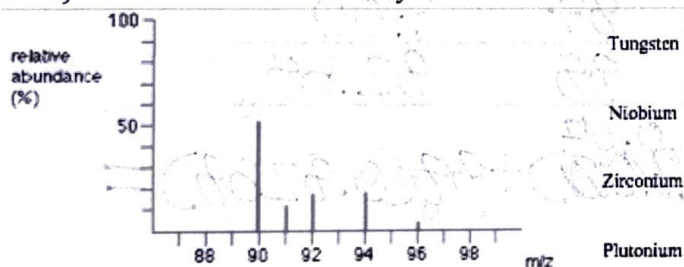
- 1) The mass spectrum of a sample of a pure element is given below. Calculate the average atomic mass of the element. What is the identity of the element?



$$24(0.7899) + 25(0.1) + 26(0.1101) = 24.32 \text{ amu}$$

Magnesium (Mg)

- 2) Determine the most likely element for the mass spectrum given below. Justify your choice.



$$90(0.5) + 91(0.1) + 92(0.15) + 94(0.2) + 96(0.05) = 91.50 \text{ amu}$$

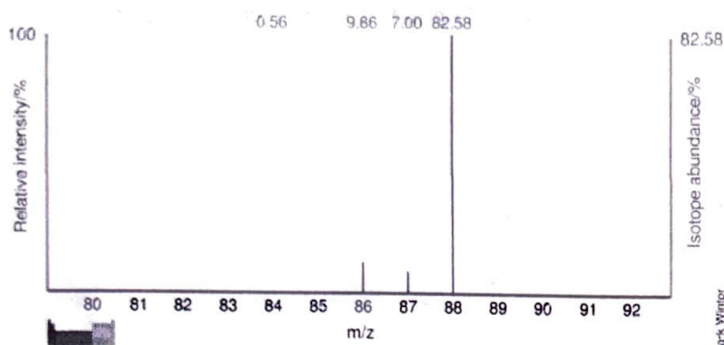
Zirconium (Zr)

- 3) In the chemical closet, you found an unlabeled vial with a solid piece of an unknown element inside (element Z). You decided to put it in the mass-spec to figure out its atomic mass. The results showed that it has two naturally occurring isotopes, Z-85, and Z-87. Z-85 has a natural abundance of 72.17% and a mass of 84.912 amu. Z-87 has a natural abundance of 27.83% and a mass of 86.909 amu. Calculate the average atomic mass and determine the identity of mystery element Z.

$$84.912(0.7217) + 86.909(0.2783) = 85.4 \text{ amu}$$

Rubidium (Rb)

4) Use the mass spectrum below to fill out the information in the table about each isotope.



| Isotope | Protons | Neutrons | Mass (amu) | Relative Abundance (%) |
|---------|---------|----------|------------|------------------------|
| Str-84  | 38      | 46       | 84         | 0.56                   |
| Str-86  | 38      | 48       | 86         | 9.86                   |
| Str-87  | 38      | 49       | 87         | 7.00                   |
| Str-88  | 38      | 50       | 88         | 82.58                  |

$$84(0.0056) + 86(0.0986) + 87(0.07) + 88(0.8258) = 87.71 \text{ amu (Strontium)}$$