



ISOTOPES LAB

Introduction:

Scientists have recently discovered the element candium (Cn). Your assignment is to calculate the average atomic mass of candium based on the samples provided. The atomic number of candium is 4. The smallest of the isotopes, Cn-4, has an atomic mass of 4 atomic mass units (amu). Cn-5, the intermediate isotope, has an atomic mass of 5 amu. The largest isotope, Cn-6, has an atomic mass of 6 amu.

Before you start, fill in the following terms: (3 marks)

- _____ are different versions of atoms having the same number of _____ but different numbers of _____.
- The _____ is a weighted average of all of the isotopes of an element as they are found in nature.

Purpose:

To calculate the average atomic mass of the newly discovered element, candium (Cd).

Procedure:

1. Count and record in the data table the total number of isotopes in the sample.
2. Count and record in the data table the number of each candium isotope. 3
3. Record the masses (provided in the introduction) of each candium isotope in the data table.
4. Calculate the average atomic mass of candium using the following equation.

$$\text{Average Atomic} = (\% \text{ Isotope 1})(\text{Mass Isotope 1}) + (\% \text{ Isotope 2})(\text{Mass Isotope 2}) + (\% \text{ Isotope 3})(\text{Mass Isotope 3})$$

Average Atomic Mass =

(3 marks)

Data and Calculations: (6 marks)

Isotope	Quantity	Mass (amu)	Total Mass (amu)
Cd-4			
Cd-5			
Cd-6			

Discussion Questions:

1. For each cadmium isotope, give the proper isotope notation. (3 marks)

2. Calculate the number of neutrons in each cadmium isotope. (3 marks)

3. According to the sample, which cadmium isotope is most abundant in nature? (1 mark)

4. If additional cadmium-6 isotopes were added to the sample, how would the average atomic mass of cadmium be affected? (1 mark)