

Bean Salad Concept Development

Problem:

1. How can you determine the percent abundance of each isotope in a sample of an element?
2. How can you determine the atomic mass for an element from percent abundance?

Materials:

baggie containing atoms (beans)
balance

Procedure:

Isotopes are atoms of an element which are chemically the same, but have different physical properties. Isotopes differ in their atomic masses. Since atoms are very small we will substitute a larger item, a bean, to represent the different isotopes of our element.

In this activity you will be using different types of beans. Each bean represents an isotope of the new element pintonium. Using the masses of your beans, find the average atomic mass of your element, pintonium. Be sure to show all of your calculations in answering each of the questions below.

Summing Up:

1. How many different isotopes were in the container?
2. What was the total mass of each group of isotopes?
3. What is the atomic mass of each isotope?
4. What were the percent abundances for each isotope in the entire sample?
5. What was the weighted average atomic mass of your sample?
6. A student obtained the following data when measuring a sample of element X:

<u>Isotope</u>	<u># of atoms</u>	<u>mass of sample</u>
A	40	400
B	160	1760

Calculate the following:

- a) percent composition of each bean.
- b) mass of each isotope.
- c) the atomic mass of element X.

What is the name of element X?