

VEGIUM Application

Problem: How can the average atomic mass of a fictitious element Vegium be calculated.

Procedure:

An Isotope is two or more atoms of the same element with different numbers of neutrons. As a result, the mass of the various Isotopes varies.

Since an atom is so small it would be nearly impossible to find an average mass of a single isotope of a given element in our laboratory. It is because of this we will use a fictitious element to symbolize an atom with different isotopes.

The element we will be working with is "Vegium". It has three different Isotopes one that looks like red beans, one that looks like white beans, and one that looks like peas. They symbolize isotopes because they are all the same element (vegium) but have a different mass because it has a different # of neutrons. Your task is to determine the average atomic mass of this element. Use what you know about how average atomic masses are calculated to find the average atomic mass of Vegium.

Before you begin consider the following questions.

What is the average mass of each of the Isotopes of Vegium?

What is the percentage that each of the Isotopes exists in your sample?

You will need the answers of these questions to solve the problem correctly. Be sure to record all data that you collected in a neat and organized data table.

Questions:

1. What is the average atomic mass of Vegium? Be sure to show all of your calculations and work.
2. Explain the logic of your calculations from question number one.
3. Why can't average atomic mass be calculated by taking the total mass of the sample and dividing it by the total number of particles.
4. What was the average atomic mass of your neighbors? How would the differences change if larger samples were used? Explain your logic.