

Name _____

How Are Isotopes Related To Elements?

Short Answer Key

1. Isotopes are different forms of the same element, each having the same number of protons but differing in the number of neutrons. They relate to elements because they are variations of elements with the same atomic number.
2. Examples of isotopes include protium, deuterium, and tritium for hydrogen; carbon-12 (^{12}C) and carbon-14 (^{14}C) for carbon; and uranium-235 (^{235}U) and uranium-238 (^{238}U) for uranium. These isotopes differ in the number of neutrons.
3. The atomic mass of an element accounts for its isotopes by considering both the abundance of each isotope and its mass in the calculation. It is a weighted average of the masses of all naturally occurring isotopes.
4. Isotopes have applications in radiocarbon dating, nuclear medicine, nuclear physics, energy production, and more. They are used for dating ancient artifacts, diagnosing medical conditions, and producing energy in nuclear reactors.
5. Yes, two isotopes of the same element can have different chemical properties if the difference in their neutron count significantly affects their stability and reactivity.

