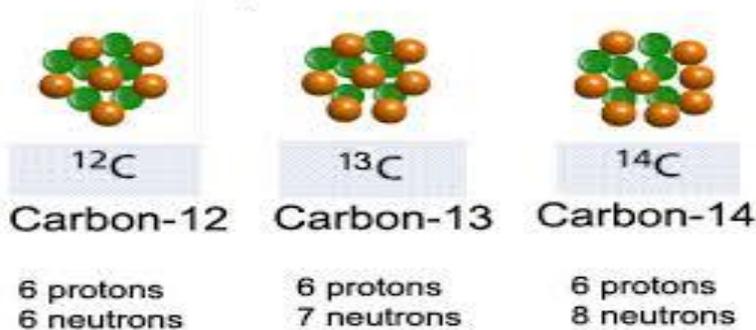




Isotopes:- are forms of an element that differ in mass and physical properties, but have the same chemical properties. While most isotopes are stable, some emit radiation. These radioactive isotopes are used in medical and industrial applications, environmental traceability studies and biological studies.

Isotopes of Carbon



What are the types of isotopes?

There are two types of isotopes: **the first** are stable isotopes that do not emit radiation, and **the second** are unstable isotopes that emit radiation and are called “radioactive isotopes.”



Why do isotopes exist?

Remember that elements may have many different isotopes to explain why the presence of isotopes contributes to the relative atomic masses of some elements not being whole numbers Calculating the relative atomic mass of an element from the relative masses and abundances of its isotopes Relating the chemical properties of an element to the number of electrons in its outer shell.

How many isotopes?

Stable isotopes

Of the 82 elements in the periodic table, 80 have stable isotopes. Measuring and analyzing their distribution allows for many practical applications.

How are isotopes calculated?

He measured the isotope ratio using isotope ratio mass spectrometry in the field of isotope analysis. For example, natural uranium has an isotope ratio of 99.3% for uranium-238 ^{238}U to 0.7% for uranium-235 ^{235}U . In order to use uranium as nuclear fuel, the percentage of the isotope uranium-235 must be raised to about 3-5%, and this is done through the uranium enrichment process.



جامعة المستقبيل
كلية العلوم / قسم الكيمياء الحياتية
أسم التدريسي :
أسم المادة :
السنة الدراسية : ٢٠٢٣ - ٢٠٢٤



What elements have no isotopes?

Most elements exist in nature in the form of mixtures of isotopes, but some few elements have no isotopes. Such as: aluminum, sulfur, and iodine.

What elements have isotope?

Carbon-12 has a nucleus containing 6 protons and 6 neutrons.

Carbon-14 has a nucleus containing 6 protons and 8 neutrons.

Iron-57: Its nucleus contains 26 protons and 31 neutrons

النظائر المشعة	النظائر المستقرة
^3H	^2D
^{14}C	^{15}N
^{32}P	^{18}O
^{35}S	
^{35}Ca	
^{125}I	
^{131}I	

الجدول 2-8 : النظائر الرئيسية المستخدمة في أبحاث الكيمياء الحيوية.