

Isotopes Quiz Answer Key PDF

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Which isotope is commonly used in carbon dating?

- A. Carbon-12
- B. Carbon-13
- C. Carbon-14 ✓**
- D. Carbon-15

Which element has isotopes with the mass numbers 1, 2, and 3?

- A. Helium
- B. Hydrogen ✓**
- C. Lithium
- D. Beryllium

In which fields are isotopes used as tracers? (Select all that apply)

- A. Environmental studies ✓**
- B. Archaeology ✓**
- C. Food industry ✓**
- D. Astronomy

What factors contribute to the instability of a radioactive isotope? (Select all that apply)

- A. Excess neutrons ✓**
- B. Excess protons ✓**
- C. Balanced proton-neutron ratio
- D. High atomic number ✓**

What is the atomic number of an isotope determined by?

- A. Number of neutrons
- B. Number of protons ✓**
- C. Number of electrons
- D. Mass number

What defines isotopes of the same element?

- A. Different numbers of protons
- B. Different numbers of electrons
- C. Different numbers of neutrons ✓**
- D. Different chemical properties

Explain why isotopes of the same element have different atomic masses.

- A. True ✓**
- B. False
- C. Not applicable
- D. Unknown

Describe the process of carbon dating and how it utilizes isotopes.

- A. It measures the amount of Carbon-12 in a sample.
- B. It uses the decay of Carbon-14. ✓**
- C. It is based on the mass of the sample.
- D. It requires a chemical analysis.

What are the implications of using radioactive isotopes in medical treatments?

- A. They are always safe to use.
- B. They can cause side effects. ✓**
- C. They are only used in research.
- D. They have no medical applications.

How does the presence of isotopes affect the calculation of an element's average atomic mass?

- A. It does not affect the calculation.
- B. It is calculated as a simple average.
- C. It is based on the most abundant isotope.

D. It is a weighted average based on abundance. ✓

Which of the following is a stable isotope of carbon?

A. Carbon-12 ✓

B. Carbon-14

C. Carbon-13

D. Carbon-11

Which isotopes are used in nuclear power generation? (Select all that apply)

A. Uranium-235 ✓

B. Plutonium-239 ✓

C. Thorium-232 ✓

D. Carbon-12

Discuss the role of isotopes in environmental studies and how they can be used to track pollution.

A. They have no role in environmental studies.

B. They can help identify pollution sources. ✓

C. They are only used in laboratory settings.

D. They are not applicable to pollution tracking.

Why are certain isotopes more suitable for use as tracers in scientific research?

A. They are always radioactive.

B. They have a long half-life. ✓

C. They are inexpensive to produce.

D. They are easy to detect. ✓

Which of the following are considered stable isotopes? (Select all that apply)

A. Carbon-12 ✓

B. Carbon-14

C. Oxygen-16 ✓

D. Uranium-238 ✓

Which isotopes are commonly used in medical imaging? (Select all that apply)

- A. Iodine-131 ✓**
- B. Technetium-99m ✓**
- C. Carbon-14
- D. Cobalt-60

Which isotope of uranium is used in nuclear reactors?

- A. Uranium-235 ✓**
- B. Uranium-238
- C. Uranium-239
- D. Uranium-234

What is the mass number of an isotope with 20 protons and 22 neutrons?

- A. 40
- B. 42 ✓**
- C. 44
- D. 46

What is the main use of radioactive isotopes in medicine?

- A. Food preservation
- B. Energy production
- C. Diagnostic imaging ✓**
- D. Fertilizer production

Which of the following elements have naturally occurring isotopes? (Select all that apply)

- A. Hydrogen ✓**
- B. Helium
- C. Carbon ✓**
- D. Neon ✓**