

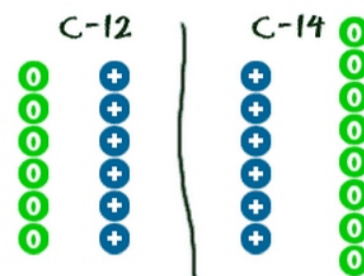
**Science 9**  
Unit 2: Chemical Reactions  
Worksheet 8: Isotopes



**Isotopes:** are atoms of the same elements that contain different numbers of neutrons. They will vary in their atomic mass.

Example: Look at the different isotopes of hydrogen shown below”

Isotope	Protons	Electrons	Neutrons	Nucleus
Hydrogen-1	1	1	0	
Hydrogen-2	1	1	1	
Hydrogen-3	1	1	2	



**Isotopes** are chemically alike because they have identical numbers of protons and electrons. However, they have difference atomic mass because they vary in the number of neutrons in the nucleus.

**PART A: MULTIPLE CHOICE**

1. Atoms of the same element that have different masses are called

- (A) Neutrons
- (B) Isotope
- (C) Nucleus
- (D) Orbits

2. Isotopes of an element contain different number of

- (A) Electrons
- (B) Electrons and Protons
- (C) Protons
- (D) Neutrons

3. All isotopes of hydrogen contain

- (A) One neutron.
- (B) Two electrons.
- (C) One proton.
- (D) Two neutrons

4. Helium-4 and Helium-3 are

- (A) Isotopes.
- (B) Different elements.
- (C) Compounds.
- (D) Alkali metals

5. All atoms of the same element have the same

- (A) Atomic mass.
- (B) Number of neutrons.
- (C) Mass number.
- (D) Atomic number

6. Isotopes are atoms of the same element that have different
- (A) chemical properties
  - (B) masses
  - (C) number of protons
  - (D) number of electrons
7. Isotopes of a given element have
- (A) same atomic mass number and a different atomic number
  - (B) different atomic mass number and a different atomic number
  - (C) the same atomic number and a different mass number
  - (D) the same atomic number and the same mass number
8. If an isotope of uranium, uranium-235, has 92 protons, how many protons does the isotope uranium-238 have?
- (A) 92
  - (B) 95
  - (C) 143
  - (D) 146
9. An atom of carbon-12 and an atom of carbon-14 differ in
- (A) Atomic number
  - (B) Mass number
  - (C) Nuclear charge
  - (D) Number of electrons
10. The atoms of the same element can have different isotopes. An isotope of an atom
- (A) Is an atom with a different number of protons
  - (B) Is an atom with a different number of neutrons
  - (C) Is an atom with a different number of electrons
  - (D) Has a different atomic number

**PART B: WRITTEN RESPONSE**

1. Fill in the blanks for the isotopes of carbon

$^{12}_6\text{C}$	$^{13}_6\text{C}$	$^{14}_6\text{C}$
# of protons =	# of protons =	# of protons =
# of electrons =	# of electrons =	# of electrons =
# of neutrons =	# of neutrons =	# of neutrons =

2. Complete the following chart:

Isotope name	atomic #	mass #	# of protons	# of neutrons	# of electrons
Carbon -14					
Oxygen -16					
Boron-12					
Sulfur -35					