

Element and Isotope Lab

Materials: Element bags, isotope bags, and periodic table.

Procedure:

Part 1: Element identification: Lettered bags

1. Count the number of protons in the bag. Record the bag number and number of protons in the data table. (Protons are represented by popcorn kernels.)
2. Count the number of neutrons. (Neutrons are represented by the white beans.) Record the number of neutrons in the data table.
3. Count the number of electrons. (Electrons are represented by the brown beans.) Record the number of electrons in the data table.
4. Determine the atomic number for the element and record in the data table.
5. Determine the mass number for the element and record in the data table. $\text{Mass \#} = P + N$
6. Identify the element name and record its symbol in the data table.
7. Repeat steps 1-7 for three bags.

Part 2: Isotopes: Numbered bags

1. Obtain an isotope bag (1-17). Record the bag number in the data table.
2. Count the number of protons. Record.
3. Count the number of neutrons. Record.
4. Count the number of electrons. Record.
5. Determine the atomic number. Record.
6. Determine the mass number. Record. $\text{Mass \#} = P + N$
7. Write the name of the isotope(element name - mass number) ex. Carbon-12
8. Write the symbol of the isotope. mass #

X example $^{12}_6\text{C}$

atomic #
9. Repeat for three isotope bags.

Data Table: Isotopes

Bag	# protons	# neutrons	# electrons	Atomic #	Mass #	Isotope name	Symbol

Lab questions: Answer these questions in complete sentences.

1. What information is provided by the atomic number?
2. What is the mass number?
3. Why do the number of protons always equal the number of electrons in an atom?
4. How do the elements differ?
5. What are isotopes?
6. How are all isotopes of an element similar?

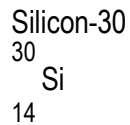
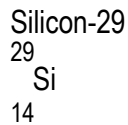
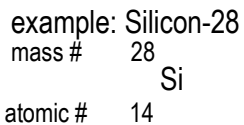
7. How are all isotopes of an element different?

Atomic Structure

Complete the following table.

Element	Atomic #	Mass #	Protons	Neutrons	Electrons	Charge
As				45		-3
		18	8			-2
		30	14			0
		3			1	0
Ca				20		+2
		81	35			-1
				28	18	+4
			16	20		-2
F		17				-1
			13	14		+3

Isotopes are atoms an element that have a different number of neutrons but the same number of protons.



Complete the following table. All of the particles are ATOMS (not ions).

Isotope	Symbol	Atomic #	Mass #	protons	neutrons	electrons
hydrogen-3	^3_1H					
	$^{90}_{38}\text{Sr}$					
		92			143	
			131	53		
cobalt-60						