

Name: _____

ATOMIC STRUCTURE ACTIVITY

Introduction

Atoms are composed of three types of subatomic particles:

- i) protons – positive charge, reside in nucleus, mass of 1 a.m.u.
- ii) neutrons – neutral charge, reside in nucleus, mass of 1 a.m.u.
- iii) electrons – negative charge, orbit around the nucleus, negligible mass

Objective

To relate the type and number of subatomic particles to a particular atom, and be able to find the atom's identity, atomic number, mass number, and charge.

Materials

16 Ziploc bags representing atoms

Red Beans = Protons

White Beans = Neutrons

Penne Pasta = Electrons

Procedure

Count and record statistics in the table for each of the 16 Ziploc bags.

Data and Observations

See table on other side of page.

Questions

1. Give the chemical symbol notation and name each isotope of hydrogen that exists in nature (see last day's notes). How do isotopes of hydrogen differ in terms of their subatomic particles?

2. Give chemical symbol notation for the three potassium particles from the activity. Circle the symbol that represents a potassium ion. In terms of subatomic particles, why is it called an ion?

3. For Ziploc Bag #8, give the chemical symbol notation and the charge. In terms of subatomic particles, explain why it has that charge.

4. A nuclear reactor generates a large amount due to the radioactivity and eventual fission of a uranium-235 atom to produce barium-139 and krypton-94. How would each of these three atoms be represented using chemical symbol notation?

Table 1 – Atomic Information for each Ziploc Bag

Bag #	# of protons	# of neutrons	# of electrons	Atomic Number	Mass Number	Charge	Chemical Symbol Notation
Example	24	26	21	24	50	+3	${}^{50}_{24}\text{Cr}^{3+}$
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							

There are two carbon particles, three hydrogen particles, three nitrogen particles, three potassium particles, two oxygen particles, two sodium particles, and one phosphorus particle.