Laboratory Investigation Name _____

Chemistry: Form L2.5A Date _____ Period _____

Drawing Atomic Diagrams

PROBLEM

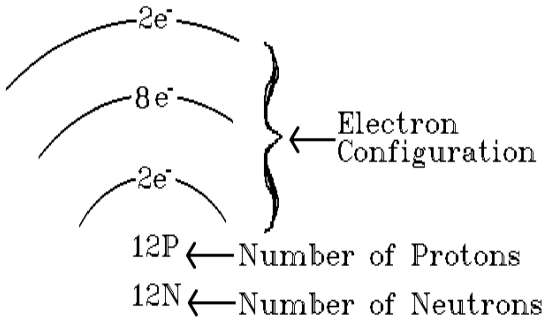
How do you draw atomic diagrams?

INTRODUCTION

Atomic diagrams show the number of protons and neutrons in the nucleus, and the distribution of electrons around the nucleus in energy levels. Atomic diagrams are extremely useful in predicting the ratios in which elements will combine. The information needed to draw atomic diagrams is found on the periodic table. The periodic table shows the atomic number which equals the number of protons or electrons, the atomic mass, and the electron configuration. It does not show the number of neutrons, but this can be determined by subtracting the atomic number from the atomic mass. For example, the atomic number of magnesium is 12 and the mass is approximately 24. This means the number of neutrons is 12. The electron configuration is 2-8-2. This information can be used to draw a diagram of magnesium. See below.

Example: Magnesium

Atomic Mass	24
-Atomic Number	12
Neutrons	12
Electrons	12
(2-8-2)	



In this laboratory investigation, you will draw diagrams similar to the diagram of magnesium above using the information on the periodic table.

MATERIALS (*per group*)

Periodic Table of the Elements

PROCEDURE

1. For each of the elements listed in the data table on the next page, find the atomic mass on the periodic table. Round it off and record the result in the data table. Find the atomic number on the periodic table and record the result. Calculate the number of neutrons by subtracting the atomic number from the atomic mass. Record the result. Find the electron configuration on the periodic table and record the result.

2. Draw an atomic diagram of each of the elements listed in the data table showing the number of protons, the number of neutrons, and the electron configuration. As in the diagram of magnesium above, the number of protons is followed by the letter "P", the number of neutrons is followed by the letter "N", and the electron configuration is shown above the number of protons and neutrons by writing the number of electrons on curved lines to represent the energy levels. The first number of the electron configuration represents electrons closest to the nucleus.

OBSERVATIONS

Element	Atomic Mass	Atomic Number	Neutrons	Electrons (Bohr config.)	Element	Atomic Mass	Atomic Number	Neutrons	Electrons (Bohr config.)
Lithium					Aluminum				
Copper					Oxygen				
Nitrogen					Chlorine				
Sodium					Carbon				
Neon					Calcium				
Iron					Fluorine				
Potassium					Zinc				
Helium					Hydrogen				
Boron					Phosphorus				
Manganese					Argon				

CONCLUSIONS

Lithium	Copper	Nitrogen	Sodium	Neon
Iron	Potassium	Helium	Boron	Manganese
Aluminum	Oxygen	Chlorine	Carbon	Calcium
Fluorine	Zinc	Hydrogen	Phosphorus	Argon