

CH 105 Supplemental Instruction  
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Periodic Table

What is the element found in Period 3, Group 3 (main block)? What is its atomic number and atomic weight? How many electrons, protons, and neutrons are present?

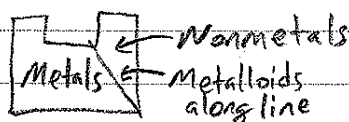
Aluminum

$$\begin{aligned} \text{mass number} &= 27 = \text{neutrons} + \text{protons} \\ \text{neutrons} &= 14 \\ \text{atomic \#} = \text{protons} &= 13 = \text{electrons} \end{aligned}$$

What property of an element determines its chemical properties?

Atomic Number

Name the eight main groups of the periodic table. Describe where metals, nonmetals, and metalloids are generally found.



Group 1: Alkali Metals  
2: Alkali Earth Metals

5: Nitrogen Family  
6: Oxygen Family  
7: Halogens  
8: Noble Gases

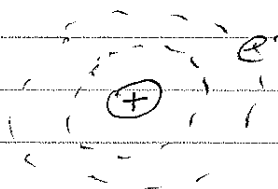
List the 4 tenants of Dalton's Atomic Theory.

- 1) All matter is composed of atoms
- 2) Atoms cannot be created or destroyed
- 3) Atoms undergo different combinations to form various compounds.
- 4) Atoms of the same element are similar in shape and mass.

What is an isotope? Give an example and justify.

An element that has the same number of protons as another element but a different number of neutrons (thus atomic mass)

Draw a representation of the Bohr Model of the atom. Interpret your drawing.



electrons are quantized (specific energy levels)

Name and determine how many protons, neutrons, and electrons are in each element.

$^{31}_{15}\text{P}$	protons (z) = 15	$e^- = 15$	$n = 16$
$^{127}_{53}\text{I}$	$z = 53$	$e^- = 53$	$n = 74$
$^{47}_{27}\text{Ag}$	$z = 47$	$e^- = 47$	$n = 61$
$^{14}_6\text{C}$	$z = 6$	$e^- = 6$	$n = 8$

Calculate the average atomic mass for Lithium.

7%  $^6\text{Li}$  (6.015 g/mol), 93%  $^7\text{Li}$  (7.016 g/mol)

$$\begin{aligned} \text{amu} &= (6.015)(.07) + (7.016)(.93) \\ &= .42105 + 6.52488 = \boxed{6.95 \text{ amu}} \end{aligned}$$

Neon has 2 major isotopes, Neon-20 and Neon-22. Out of every 250 neon atoms, 225 will be Neon-20 (19.992 g/mol) and 25 will be Neon-22 (21.991 g/mol). Find the average atomic mass of Neon.

$$\begin{aligned} \text{amu} &= \left(\frac{225}{250}\right)(19.992) + \left(\frac{25}{250}\right)(21.991) \\ &= 18 + 2.2 \\ &= \boxed{20.2 \text{ amu}} \end{aligned}$$

Calculate the percent abundance of the two isotopes of Nitrogen if  $^{14}\text{N}$  (13.9 g/mol) and  $^{15}\text{N}$  (14.7 g/mol) provide an average mass of 14.01 g/mol.

$$14.01 \text{ amu} = (13.9)(x) + (14.7)(1-x)$$

$$.8x = .69 \quad (1-x) = .1375$$

$$x = .8625$$

$$\begin{aligned} ^{14}\text{N} &= \boxed{86.25\%} \\ ^{15}\text{N} &= \boxed{13.75\%} \end{aligned}$$

Is there more of  $^{35}\text{Cl}$  or  $^{38}\text{Cl}$ ?

$\boxed{^{35}\text{Cl}}$  because amu is 35.45 amu