

Atomic Structure Review

1. The 3 particles of the atom are:

a. <u>protons</u> b. <u>neutrons</u> c. <u>electrons</u>	Their respective charges are: a. <u>positive</u> b. <u>neutral</u> c. <u>negative</u>
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2. The atomic number tells you the number of protons in one atom of an element. It also tells you the number of electrons in a neutral atom of that element. The atomic number gives the "identity" of an element as well as its location on the Periodic Table. No two different elements will have the same atomic number.

3. The atomic mass (weight) of an element is the average mass of an element's naturally occurring atom, or isotopes, taking into account the abundance of each isotope.

4. The mass number of an element is the total number of protons and neutrons in the nucleus of the atom.

5. The mass number is used to calculate the number of neutrons in one atom of an element. In order to calculate the number of neutrons you must subtract the atomic # (protons) from the mass #.

6. Give the symbol and number of protons in one atom of: ← atomic #

Lithium <u>Li</u> <u>3p⁺</u>	Bromine <u>Br</u> <u>35p⁺</u>
Iron <u>Fe</u> <u>26p⁺</u>	Copper <u>Cu</u> <u>29p⁺</u>
Oxygen <u>O</u> <u>8p⁺</u>	Mercury <u>Hg</u> <u>80p⁺</u>
Krypton <u>Kr</u> <u>36p⁺</u>	Helium <u>He</u> <u>2p⁺</u>

7. Calculate the number of electrons in a neutral atom of: ← protons = electrons if neutral

Uranium <u>U</u> <u>92e⁻</u>	Chlorine <u>Cl</u> <u>17e⁻</u>
Boron <u>B</u> <u>5e⁻</u>	Iodine <u>I</u> <u>53e⁻</u>
Antimony <u>Sb</u> <u>51e⁻</u>	Xenon <u>Xe</u> <u>54e⁻</u>

8. Calculate the number of neutrons in one atom of: ← neutrons = mass # - p

Barium-138 <u>138 - 56 = 82n⁰</u>	Bismuth-208 <u>208 - 83 = 125n⁰</u>
Carbon-12 <u>12 - 6 = 6n⁰</u>	Hydrogen-1 <u>1 - 1 = 0n⁰</u>
Fluorine-20 <u>20 - 9 = 11n⁰</u>	Magnesium-24 <u>24 - 12 = 12n⁰</u>
Europium-152 <u>152 - 63 = 89n⁰</u>	Mercury-201 <u>201 - 80 = 121n⁰</u>

9. Name the element which has the following numbers of particles:
- a. 26 electrons, 29 neutrons, 26 protons Iron ^{55}Fe
 - b. 53 protons, 74 neutrons Iodine ^{127}I
 - c. 2 electrons (neutral atom) Helium He
 - d. 20 protons Calcium Ca
 - e. 86 electrons, 125 neutrons, 82 protons (charged atom) lead $^{207}\text{Pb}^{4-}$

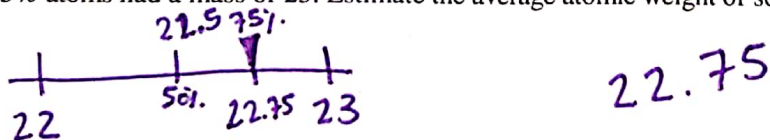
10. If you know only the following information can you always determine what the element is? (Yes/No).

- a. number of protons yes
- b. number of neutrons no
- c. number of electrons in a neutral atom yes
- d. number of electrons no

11. Fill in the missing items in the table below.

Name	Atomic #	Mass #	#p	#e	#n	Atomic Notation
phosphorus	15	31	15	18	16	$^{31}\text{P}^{3-}$
Iron	26	56	26	15	30	$^{56}\text{Fe}^{11+}$
Calcium	20	40	20	22	20	$^{40}\text{Ca}^{2-}$

12. Suppose that there were two isotopes of Sodium. 25% of the naturally occurring sodium atoms had a mass of 22, and 75% atoms had a mass of 23. Estimate the average atomic weight of sodium be?



13. Suppose that there were two natural isotopes of Copper and the atomic mass was 64.6. The two isotopes have a mass of 63 and 65. What would be the approximate percent abundance for each isotope?

