**CHE 101 - Homework - Ch 1b**

p. 89-93 **Structure of the Atom II** Score: _____/50

Name: _____ Date: _____

[12 pt] 1. From a chemists point of view, what are the essential differences between a proton, a neutron and an electron (charge, mass, location, and major use/effect).

| **Particle** | **Symbol** | **Charge** | **Relative Mass** | **Location** | **Importance** |
|---|---|---|---|---|---|
| Proton | | | | | |
| Neutron | | | | | |
| Electron | | | | | |

[3 pt] 2. Differentiate between an atom, a cation and an anion.

[3 pt] 3. Draw a chemical reaction (using pictures or symbols) showing the formation of a $Ca^{+2}$ cation ($Ca^{+2}$) from a neutral calcium atom.

[3 pt] 4. Draw a chemical reaction (using pictures or symbols) showing the formation of a $Li^{+1}$ cation from a neutral lithium atom.

[3 pt] 5. Draw a chemical reaction (using pictures or symbols) showing the formation of a $Cl^{-1}$ anion from a neutral chlorine atom.

[3 pt] 6. Draw a chemical reaction (using pictures or symbols) showing the formation of a $O^{-2}$ anion from a neutral oxygen atom.

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[5 pt] 7. Answer the following questions about the following isotope: ${}^{72}_{34}X^{-2}$.

(a) How many protons are there? 7(a) _____

(b) How many electrons are there? 7(b) _____

(c) How many neutrons are there? 7(c) _____

(d) What element is this an isotope of? 7(d) _____

(e) Is this a cation or anion? 7(e) _____

[4 pt] 8. Answer the following questions about the following isotope: ${}^{55}Fe^{+3}$.

(a) How many protons are there? 8(a) _____

(b) How many electrons are there? 8(b) _____

(c) How many neutrons are there? 8(c) _____

(d) Is this a cation or anion? 8(d) _____

[5 pt] 9. Write the isotope notation for the following (For example: ${}^{23}_{11}\mathrm{Na}^{+1}$):

(a) protons = 29, neutrons = 31 electrons = 29 9(a) _____

(b) Z = 12, A = 26 $e^-$ = 11 9(b) _____

(c) 4 neutrons, 3 protons and 2 electrons 9(c) _____

(d) A = 17, 9 protons and 10 electrons 9(d) _____

(e) Z = 1, A = 1 and 0 electrons 9(e) _____

[5 pt] 10. For each of the atoms of ions described in Question 9, indicate whether it is a (N)eutral atom, (C)ation of (A)nion

(a) 10(a) _____

(b) 10(b) _____

(c) 10(c) _____

(d) 10(d) _____

(e) 10(e) _____

[4 pt] 11. An element has two isotopes, one is 60.4% abundant with a mass of 68.9257 amu and the second is 39.6% abundant with an atomic mass of 70.9249 amu. Determine the average molecular mass of the element and determine the identity of the element.