Unit 3 B Atoms, Moles and the Periodic Table Outline and Review Sheet

Topic 1: p^+, n^0, e^-

1. Find the number of protons, neutrons and electrons in the most common isotope of the element potassium (K).

Topic 2: Average atomic mass

2. Find the average atomic mass of chlorine given that it has the following isotopes at the given percent abundances (Candium Lab)

Cl – 35	34.969 amu	75.78 %
Cl – 37	36.966 amu	24.22 %

3. a. Which of the following isotopes of neon is most abundant in nature (hint: find the average mass of all of them on the periodic table) b. explain your reasoning.

Ne – 20 Ne – 21 Ne – 22

Topic 3: Formula mass, gram – mole – particle

4. a. One _____ of any element contains _____ atoms of that element

b. One _____ of any compound contains _____ molecules of that compound

5. a. One _____ of Phosphorous contains _____ grams of phosphorous atoms

b. One _____ of Ammonia (NH_3) contains _____ grams of NH_3

6. How many molecules of NH_3 would be found in 55.3 grams of Ammonia? See 5 b. USE UNIT ANALYSIS!!!!

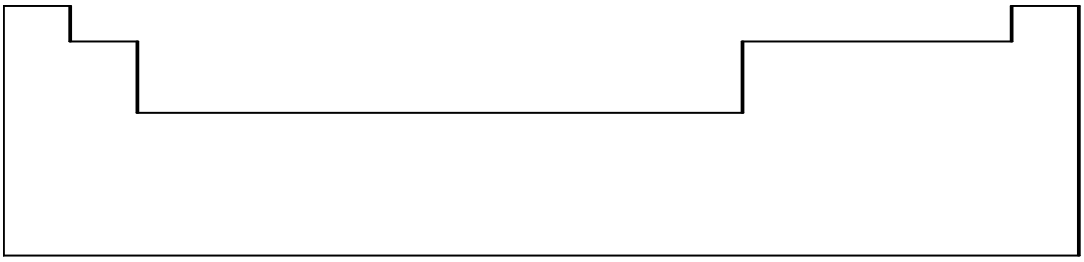
Topic 4: Periodic Table

7. On the periodic table: Vertical columns are called _____

Horizontal rows are called _____

8. How many outermost electrons (called _____ electrons) are found in the following elements? Ca _____ C _____ I ____ He ____

9. Indicate where the following groups are on the periodic table given below by writing the number in the correct location: 1) alkali metals, 2) alkali earth metals, 3) halogens, 4) noble gases, 5) metalloids, 6) transition metals, 7) general place of metals and 8) nonmetals



Topic 5: Absorption and emission

10. When we did flame tests, we saw that different elements gave off a different color of light when it was placed in the fire. The reason for this as the Bohr model would say is…

Atoms of each element _____ energy from the heat of the flame. _____ in the atoms jumped from lower energy levels (called the _____ state) to _____ energy levels (called the _____ state). Then, almost immediately, electrons returned to the ground state and _____ the energy it lost in the form of _____. Different energy jumps required different amounts of energy. This in turn gave off different _____ of light. Potassium gave off _____ light which has _____ energy than the _____ light given off by lithium.

Topic 6: Electron Configurations and orbital diagrams

11. The number of electrons that fit in: an orbital = _____ a p sublevel = _____
12. The number of orbitals that fit in: an s sublevel = ___ a d sublevel = _____
13. Draw the "picture" of the 3 dimensional shape of an a) s sublevel and b) p sublevel

14. In $4d^6$ the 4 represents the _____, the d is the _____ the 6 is the _____
15. Write the e^- configuration and orbital diagram for each of the following. You may use the sortcut.

P

Sn (tin)

Topic 7: Periodic Trends

16. a. As you go down a column on the periodic table, the atomic radius _____ because…

b. As you go across a row (period) left to right, the atomic radius _____ because…

17. a. As you go down a column on the periodic table, the ionization energy I. E. _____ because…

b. As you go across a row (period) left to right, the ionization energy _____ because…

18. Electronegativity and ionization energy is _____ for metals and _____ for non-metals.
19. Circle the atom in each pair with the <u>larger</u> radius: a. K or Ca b. Si or Sn
20. Circle the atom in each pair with the higher I. E. a. Zr or Ti b. Sr or In
21. Circle the atom with the higher electronegativity a. Cs or Na b. Te or Rb

Topic 8: Scientists

Came up with first atomic model with energy levels _____
Discovered electron _____ Discovered neurtron _____

Discovered nucleus _____ with the _____ experiment

First atomic theory based on experiment _____ - still mostly correct