

## Benchmark #2 Review Questions for Practice

Complete the questions on binder paper. These will help prepare you for the practice multiple choice test on Monday, and the benchmark on Tuesday. **PLEASE DO THESE!!!!**

- 1) Define Heisenberg's uncertainty principle
- 2) Define Hund's Rule
- 3) Define the Aufbau principle
- 4) Define the Pauli Exclusion Principle
- 5) Define Electron Configuration
- 6) Write the electron configuration for Bromine
- 7) Write the electron configuration for Cesium
- 8) Write the electron configuration for Barium
- 9) Write the noble gas configuration for Tellurium
- 10) Write the noble gas configuration for Tungsten (don't forget about the f electrons!  $f^{14}$ )
- 11) Write the noble gas configuration for Gold
- 12) Write the noble gas configuration for Rubidium
- 13) Label a periodic table with the following groups:
  - a. Alkali metals
  - b. Alkaline earth metals
  - c. Halogens
  - d. Noble Gases
  - e. Metalloids (semi conductors)
- 14) Which group does Potassium belong to? (Group # and Type)
- 15) Which group does Krypton belong to? (Group # and Type)
- 16) Which group does Magnesium belong to? (Group # and Type)
- 17) Which group does Silicon belong to? (Group # and Type)
- 18) List the four types of quantum numbers
- 19) What are the names and corresponding symbols for the four quantum numbers
- 20) What trend in atomic radius do you see as you go down a group on the periodic table? What causes this trend?
- 21) What trend in atomic radius do you see as you go across a period (left to right) on the periodic table? What causes this trend? (think about the NUCLEAR CHARGE – amount of positive charge inside the nucleus. Does it increase or decrease)
- 22) What happens to the radius of an element if it loses an electron and becomes a cation?
- 23) What happens to the radius of an element if it gains an electron and becomes an anion?

- 24) What trend in ionization energy do you see as you go down a group on the periodic table? What causes this trend?
- 25) What trend in ionization energy do you see as you go across a period (from left to right) on the periodic table? What causes this trend? (think about the NUCLEAR CHARGE – amount of positive charge inside the nucleus. Does it increase or decrease)
- 26) The colors of the atomic emission spectrum for a specific element depends on what?
- 27) Write the electron configuration for Manganese. Now count up how many electrons are in the 3<sup>rd</sup> energy level (3s electrons + 3p electrons + 3d electrons).
- 28) How many electrons can you have in an s orbital? p orbital? d orbital? f orbital?
- 29) How many s orbitals are there? How many p orbitals? d orbitals? f orbitals?
- 30) How many electrons are allowed in EACH of the s orbitals? p orbitals? d orbitals? f orbitals? (trick question! You should get the same answer for each!)
- 31) How many valence electrons do the alkali metals have? Alkaline earth metals? What type of ion (cation, anion) do they both like to form? What is the charge on an alkali metal ion? What is the charge on an alkaline earth metal ion?
- 32) If an element has the electron configuration of  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$  what kind of group does it belong to? (alkali metal, alkaline earth metal, transition metal, halogen, etc)
- 33) What group of elements can react chemically by losing electrons from both s and d orbitals? (The group that has all the strange exceptions!)
- 34) Which halogen has the highest tendency to gain electrons? The least?
- 35) Which group number (1A, 2A, etc) on the periodic table has 6 electrons in the outermost principle energy level (VALENCE ORBITAL)
- 36) When you remove electrons from an atom to form a cation, most elements will lose the electrons from the highest s orbital before anywhere else (except the transition elements... those can lose electrons from s or d). So if the electron configuration for Strontium is  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2$  what should the electron configuration for Sr(II)  $[Sr^{2+}]$  look like? Remove the highest s electrons first!