

**Name:**

**Period:**

**Seat#:**

**Directions:** Any worksheet that is labeled with an \* means it is suggested extra practice. We do not always have time to assign every possible worksheet that would be good practice for you to do. You can do this worksheet when you have extra time, when you finish something early, or to help you study for a quiz or a test. If and when you choose to do this Extra Practice worksheet, please do the work on binder paper. You will include this paper stapled into your Rainbow Packet when you turn it in, even if you didn't do any of this. We want to make sure we keep it where it belongs so you can do it later if you want to (or need to). If you did the work on binder paper you can include that in your Rainbow Packet after this worksheet. If we end up with extra class time then portions of this may turn into required work. If that happens you will be told which problems are turned into required. Remember there is tons of other extra practice on the class website...and the entire internet! See me if you need help finding practice on a topic you are struggling with.

- 1) Rank the sets of atoms from smallest to largest atomic radius.
  - a) Li, C, F
  - b) Li, Na, K
  - c) Ge, P, O
  - d) C, N, Al
- 2) Rank each set of atoms from lowest to highest ionization energy.
  - a) Mg, Si, S
  - b) Mg, Ca, Ba
  - c) F, Cl, Br
  - d) Ba, Cu, Ne
  - e) Si, P, He
- 3) Rank each set of atoms from highest to lowest electronegativity.
  - a) Li, C, N
  - b) C, O, Ne
  - c) Si, P, O
  - d) K, Mg, P
  - e) S, F, He
- 4) Brainstorm a mnemonic to help you remember which way the three trends (radius, ionization energy, electronegativity, electron affinity) increase on the PT (up/down/left/right)
- 5) Rank the following elements by increasing atomic radius: carbon, aluminum, oxygen, potassium.
- 6) Rank the following elements by increasing electronegativity: sulfur, oxygen, neon, aluminum.
- 7) Why does fluorine have a higher ionization energy than iodine?
- 8) Why do elements in the same family generally have similar properties?
- 9) Indicate whether the following properties increase or decrease from left to right across the periodic table.
  - a) atomic radius (excluding noble gases)
  - b) ionization energy
  - c) electronegativity
  - d) electron affinity
- 10) What trend in atomic radius occurs down a group on the periodic table? What causes this trend?
- 11) What trend in ionization energy occurs across a period on the periodic table? What causes this trend?
- 12) Circle the atom in each pair that has the largest atomic radius.
  - a) Al or B
  - b) S or O
  - c) O or F
  - d) Na or Al
  - e) Br or Cl
  - f) Mg or Ca
- 13) Circle the atom in each pair that has the greater ionization energy.
  - a) Li or Be
  - b) Ca or Ba
  - c) Na or K
  - d) P or Ar
  - e) Cl or Si
  - f) Li or K
- 14) Define electronegativity.
- 15) Circle the atom in each pair that has the greater electronegativity.
  - a) Ca or Ga
  - b) Br or As
  - c) Li or O
  - d) Ba or Sr
  - e) Cl or S
  - f) O or S

## Dougherty Valley HS Chemistry

### Periodic Table and Trends – Extra Practice

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- 16) Define electron affinity.
- 17) Circle the atom in each pair that has the greater electronegativity.
- Ca or Ga
  - Br or As
  - Li or O
  - Ba or Sr
  - Cl or S
  - O or S
- 18) Define shielding
- 19) Define “effective nuclear charge”
- 20) Calculate the  $Z_{\text{eff}}$  for each atom:
- Li
  - Ca
  - Al
  - Se
  - Br
  - Ar
- 21) What is a group?
- 22) What is a period?
- 23) Why are noble gases “happy” and inert?
- 24) List everything you are now able to find by looking at the periodic table. You should be able to list over 15 things!
- 25) Describe the pattern on the periodic table that helps you figure out how many valence electrons the “A group” elements have. Give some examples.
- 26) Describe the pattern on the periodic table that helps you figure out what charge the “A group” elements like to make. Give some examples.
- 27) Why do things in the same family behave the same way?
- 28) Give an example of two ions that each have a larger atomic radius than their neutral parent atom.
- 29) Give an example of two ions that each have a smaller atomic radius than their neutral parent atom.
- 30) Which halogen has the strongest tendency to gain an electron? Which has the least tendency? Why?
- 31) Describe why sometimes there is a drastic leap in the magnitude of an ionization energy when going from 1<sup>st</sup> to 2<sup>nd</sup>, or 2<sup>nd</sup> to 3<sup>rd</sup>, or 3<sup>rd</sup> to 4<sup>th</sup> etc. Give an example.
- 32) Based off pattern predictions, not actual data, which ion is smaller  $\text{Ca}^{2+}$  or  $\text{Br}^-$ ?