

*This list is a general guideline to help you study. It is NOT a definitive list. There are potentially things on here that will not show up on the test, and there are potentially things not on this list that will show up on the test. Material that appeared in Warm Ups, Notes, Homework, Classwork, Labs, Study Materials, etc are all have the potential to appear on the test.*

+ denotes calculations

### Periodic Table

- Know the names of the groups on the periodic table
  - o Alkali metals, alkaline earth metals, transition metals, semi-metals(metalloids), other non-metals, halogens, noble gases, rare earth metals
- Know how to use the periodic table to find the number of valence electrons for s and p block
- Know how to use the periodic table to find the charge each element likes to make
- Define the following trends
  - o Atomic radius
  - o Electronegativity
  - o Ionization energy
  - o Electron affinity
  - o Ionic radius
  - o Reactivity
- Describe how the trends above change as you go up/down left/right on the periodic table
- Explain WHY the trends above change as you go up/down left/right on the periodic table
  - o Make sure you are including terms such as greater effective nuclear charge, shielding, energy levels, etc – BUT make sure you are also explaining what those mean in terms of distance from nucleus and the attraction strength between nucleus and valence electrons
    - Make sure you are thinking about the difference between an ok answer, a better answer, and the BEST answer!
- Be able to rank elements from small to big, or big to small for the trends listed above.
  - o Do not worry about exceptions for simple ranking problems

### Bonding

- Types of bonds and properties of each type
  - o Ionic transfers electrons, covalent shares, metallic delocalized free flowing sea of e<sup>-</sup>
  - o Draw and explain the “sea of electrons” model regarding metallic bonding.
  - o Explain why these delocalized electrons allow for conductivity
  - o Describe the difference between properties of ionic, covalent, metallic compounds
  - o Identify ionic and covalent compounds based on what class of elements they are made of? Metal-metal, metal-nonmetal, nonmetal-nonmetal
  - + Be able to tell if particular bonds between elements are ionic or covalent using electronegativity differences (numbers will be provided)
- Naming and Writing Formulas
  - o Ionic – must be neutral, crossing over
  - o Covalent – prefixes
- Lewis Structures
  - o Know the octet rule. Be able to explain some of the exceptions to the rule. Which elements have an exception to the octet rule? Understand that anything can break the rule if it has to.
  - o Draw Lewis Structures of single bonds, double bonds, triple bonds, ions
  - o Draw Lewis Structures of “weird” molecules that break the “rules”

- VSEPR
  - o Identify molecular geometry (memorized from chart)
  - o Identify bond angles (memorized from chart)
  - o Identify electron geometry and hybridization when provided with a VSEPR chart
- Polarity
  - o Identify if a bond or molecule is polar or nonpolar
  - o What does it mean to be a polar bond?
  - o Draw the polarity of a molecule using arrows or partial positive/negative symbols

## Reactions

- Signs of a reaction
- Basic vocabulary
  - o Reactant
  - o Product
  - o Word equations
  - o Skeleton equations
  - o Conservation of mass
- Balancing equations
- Identify the types of chemical reactions
  - o Synthesis
  - o Combustions
  - o Decomposition
  - o Single Replacement
  - o Double Replacement
- Predict products
  - o Use the identified type of reaction to follow the pattern and predict the products
    - DON'T STEAL SUBSCRIPTS!!!!
      - Make valid neutral formulas by crossing over FROM SCRATCH
      - Careful about diatomics!
      - Balance when done to fix any conservation of mass issues
  - o Use Activity Series to see if single replacement reactions actually happen
  - o Use Solubility Chart to see what phase each compound is in for single and double replacement reactions
- Net ionic equations
  - o Be able to "put it all together"
    - Names of reactants → formulas → identify type of reaction → predict the products → balance → identify phases using solubility chart → write complete ionic equation showing the aqueous compounds broken apart → identify spectator ions → write net ionic equation with spectator ions gone