**Science 10: Chemistry Unit Exam Review**

**Review Questions:**

1. What is the atomic number for Cobalt? **27**
2. Which element has the atomic number 36? **Krypton**
3. Complete the table.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Element** | **Symbol** | **Atomic Number** | **Atomic Mass** | **Number of Protons** | **Number of Neutrons** | **Number of Electrons** |
| Magnesium | **Mg** | **12** | **24** | **12** | **12** | **12** |
| **Chromium** | **Cr** | **24** | 52 | **24** | **28** | **24** |

1. Which element is in group 11, period 5? **Silver**
2. Draw an electron shell diagram (Bohr Diagram) for Calcium.
3. Draw an electron dot diagram (Lewis Structure) for Phosphorus.
4. What is the valence shell? Where is it located? **Outermost shell**
5. What is the maximum number of electrons for the first two electron shells? **Shell 1 – 2, Shell 2 - 8**
6. Give the names of groups **1 Alkali metals, 2 Alkaline Earth Metals, 3-12 Transition Metals, 17 Halogens, 18 Noble Gases**
7. On the periodic table, where are the metals? **Left of the staircase.** The non-metals? **Right of the staircase.**
8. What is an anion **Gained electrons – negative charge**? What is a cation **Lost electrons – positive charge**?
9. How does a neutral atom become an anion **Gain electrons**? A cation **Lose electrons**?
10. Complete the table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ion** | **Symbol** | **Number of Protons** | **Number of Electrons** | **Lost or Gained** | **Anion or Cation** |
| Potassium | **K+** | **19** | **18** | **Lost** | **Cation** |
| Sulphur | **S2-** | **16** | **18** | **Gained** | **Anion** |

1. Draw the formation of the ionic compound that will form between Na and N using Lewis Structures.
2. Name the following ionic compounds (don’t forget the special rules for transition metals):
3. NaBr **sodium bromide**
4. Al2(CO3)3 **aluminum carbonate**
5. FeO **iron (II) oxide**
6. Write the formula for the following ionic compounds: Cr NO3
7. chromium (III) nitrate **Cr(NO3)3**  3+ 1- 1- 1-
8. sodium iodide **NaI**
9. iron (III) sulphite **Fe2(SO3)3** Fe SO3

3+ 2- 2-

3+ 2-

1. What is the difference between an ionic compound and a molecular compound?

**Ionic – electrons are transferred, Covalent (molecular) - electrons are shared**

1. Name the following covalent compounds:
2. ClO2 **chlorine dioxide**
3. N2O **dinitrogen monoxide**
4. P2O5 **diphosphorous pentoxide**
5. Write the formula for the following covalent compounds:
6. phosphorous pentachloride **PCl5**
7. carbon tetrachloride **CCl4**
8. dihydrogen monoxide **H2O**
9. What is a diatomic molecule? **2 atoms - HOFBrINCl**
10. Decide if the following compounds are **ionic (+/-) or covalent (-/-)** and name them/ write their formulas correctly.

|  |  |  |  |
| --- | --- | --- | --- |
| Aluminum iodide | **I - AlI3** | Pb3P2 | **I – lead(II) phosphide** |
| Copper (II) sulf**ate** | **I – CuSO4** | CF4 | **C – carbon tetrafluoride** |
| Diiodine heptoxide | **C – I2O7** | NO2 | **C – nitrogen dioxide** |
| Potasssium nitrate | **I – KNO3** | BeF2 | **I – beryllium fluoride** |
| Nitrogen monoxide | **C - NO** |  |  |

1. Draw the formation of the compound carbon tetrachloride using Lewis structures.
2. Distinguish between an acid and a base (their characteristics).

**Acid – sour taste, corrosive, destroy metal, pH lower than 7, litmus paper turns red, start with H**

**Base – bitter taste, corrosive, pH higher than 7, litmus paper turns blue, phenolphthalein turns pink, end in OH**

1. Explain how to name the 2 different types of acids (i.e. HBr (aq)  vs. H2SO3(aq)).

HBr (aq)  H2SO3(aq)

***H + element* so hydrobromic acid *H + polyatomic (sulfite) no hydro*, sulfurous acid**

1. Explain the acid/base indicators used during class.
2. On the pH scale, where is a base **pH 7.1-14**? An acid **pH 0-6.9**? A neutral substance? pH 7
3. In the formula 4Cu(NO3)2, how many atoms of each element are there?

**Cu – 4 N – 8 O - 24**

1. Balance the following equations and identify the reaction type:
2. **2**Al + **3**H2SO4 → **3**H2 + Al2(SO4)3 **Reaction type: Single displacement (SD)**
3. \_\_FeCl3 +**3**KOH → **3**KCl + \_\_Fe(OH)3 **Reaction type: Double displacement (DD)**
4. Sodium chloride breaks into sodium and chlorine.

**2NaCl 🡪 2Na + Cl2****Reaction type: decomposition (D)**

1. Gasoline (C8H18) is burned in the presence of oxygen to form water and carbon dioxide.

**2C8H18 + 25O2 🡪 18H2O + 16CO2****Reaction type: combustion**

1. Carbonic acid reacts with calcium hydroxide (find the products after identifying the reaction type)

**H2CO3(aq) + Ca(OH)2 🡪 CaCO3 + 2H2O** **Reaction type: DD neutralization**