Quiz 8A

1. Indicate whether each of the following statements described ionic or covalent compounds (4 points).

|  |  |  |
| --- | --- | --- |
| a.  | Atoms gain or lose electrons to form stable noble gas configurations. | Ionic Compound |
| b.  | Exist as crystalline structures rather than molecules.  | Ionic Compounds |
| c. | Atoms form a chemical bond by sharing pairs of electrons between them.  | Covalent Compound |
| d.  | Compound formulas are often predicted by group numbers of component elements.  | Ionic Compounds |

1. Circle the one in each pair with the larger radius (3 points):
	1. Fe2+ or Fe3+
	2. A potassium atom or a potassium ion.
	3. A sodium ion or a chloride ion.
2. Is this week’s experiment a wet lab or a dry lab (1 point)? \_\_\_\_dry lab\_\_\_\_\_
3. Calculate the number of valence electrons in the following compounds (4 points):
	1. Magnesium fluoride, MgF2 $\left(\frac{0 VE}{Mg^{2+}}\right)\left(1 Mg^{2+}\right)+ \left(\frac{8 VE}{F^{-}}\right)\left(2 F^{-}\right)=16 VE$



* 1. Ammonia, NH3  $\left(\frac{5 VE}{N}\right)\left(1 N\right)+ \left(\frac{1 VE}{H}\right)\left(3 H\right)=8 VE$



* 1. Acetone, CH3COCH3 $\left(\frac{4 VE}{C}\right)\left(3 C\right)+ \left(\frac{1 VE}{H}\right)\left(6 H\right)+\left(\frac{6 VE}{O}\right)\left(1 O\right)=24 VE$



1. Using the periodic table, identify each element given the description (2 points):
	1. the noble gas with the highest first ionization energy. \_\_\_\_\_helium (He)\_\_\_
	2. the element in Period 4 with the lowest metallic character. \_\_\_krypton (Kr)\_\_\_\_
2. The half-life of phosphorus-32 is 2 weeks. How much phosphorus-32 from a 512 g sample remains after five half-lives (3 points)?

$$512 g → 256 g→ 128 g→ 64 g→ 32 g→16 g$$

1. Write the correct equation when $$ loses a beta particle from its nucleus (3 points).

$$\rightarrow +$$

Quiz 8B

1. Write the correct equation for the loss of an alpha particle from the nuclide $$ (3 points).

$$\rightarrow +$$

1. Cobalt-60 has a half-life of 5.26 years. If 3.53 g of cobalt-60 were allowed to decay, how many grams would be left after four half-lives (3 points)?

$$3.53 g → 1.765 g→ 0.8825 g→ 0.44125 g→ 0.221 g$$

1. Indicate whether each of the following statements described ionic or covalent compounds (4 points).

|  |  |  |
| --- | --- | --- |
| a.  | Compound formulas are often predicted by group numbers of component elements.  | Ionic Compounds |
| b.  | Formed by the combination of nonmetal elements.  | Covalent Compound |
| c. | Bond formed by the electrostatic attraction between oppositely charged ions.  | Ionic Compounds |
| d.  | Bond formation involves overlapping of electron orbitals from component atoms.  | Covalent Compounds  |

1. Circle the one in each pair with the larger radius (3 points):
	1. Cu+ or Cu2+
	2. A strontium atom or an iodine atom.
	3. A rubidium ion or a strontium ion.
2. Is this week’s experiment a wet lab or a dry lab (1 point)? \_\_\_\_dry lab\_\_\_\_\_
3. Calculate the number of valence electrons in the following compounds (4 points):
	1. Calcium sulfide, CaS $\left(\frac{0 VE}{Ca^{2+}}\right)\left(1 Ca^{2+}\right)+ \left(\frac{8 VE}{S^{2-}}\right)\left(1 S^{2-}\right)=8 VE$



* 1. Carbon dioxide, CO2 $\left(\frac{4 VE}{C}\right)\left(1 C\right)+ \left(\frac{6 VE}{O}\right)\left(2 O\right)=16 VE$



* 1. Ethanol, CH3CH2OH $\left(\frac{4 VE}{C}\right)\left(2 C\right)+ \left(\frac{1 VE}{H}\right)\left(6 H\right)+\left(\frac{6 VE}{O}\right)\left(1 O\right)=20 VE$



1. Using the periodic table, identify each element given the description (2 points):
	1. the element in Period 4 with the lowest first ionization energy. potassium (K)
	2. the element in Period 2 with the greatest metallic character. \_\_\_\_lithium (Li)\_\_\_\_