**SI WORKSHEET 4**

1. Tetrahydrocannabinol has the formula C21H30O2, what is the percent composition for Carbon in this molecule? 252/314 = 80.1% Carbon
2. There is a relatively well-known compound with the formula C8H10N4O2, Is this its molecular or empirical formula? Give the molar mass for the empirical formula. This is the molecular formula because all the numbers can be divided by 2 to give you the empirical formula C4H5N2O that has a molar mass of 97.1 g/mol
3. A compound is 7.692% Hydrogen and 92.308% Carbon and has a molecular formula of C6H6. What is the empirical formula for this compound? For this problem there were two ways to do it, the quickest way would have been to divide the molecular formula by 6 to give you CH. The second way is to systematically work towards the answer:

$$\frac{7.692 g H}{}x\frac{1 mole H}{1 g H}=7.692 moles H$$

$$\frac{92.308 g C}{}x\frac{1 mole C}{12.01 g C}=7.692 moles C$$

Now that we have moles of each element we divide each of the molar amounts by the least amount of moles. In this case though both elements have the same amount of moles present and so it doesn’t matter which one choose to divide by. 7.692/7.692 = 1 🡨 that number corresponds to number of each element that is present in the compound.

1. A compound is 60.5% Sodium, 10.5% Hydrogen, and 29.0% Boron, What is an empirical formula for such a compound? What would the molecular formula be for this compound if the compound weighs 190g/mol?

Refer to number 3 on how to solve this. EF= NaBH4 , the MF is Na5B5H20

1. There is a compound that is 53.33% oxygen, 6.67% Hydrogen, and 40% Carbon; yet, weighs 180 g/mol. What is the molecular formula for this compound? REFER to #3 on how to solve but the MF would be C6H12O6 which is the molecule glucose.
2. Name the 7 diatomic elements and their states at room temperature: H2, N2, O2, F2, Cl2, Br2, I2. All are gases at room temperature except Bromine, which is a liquid, and Iodine, which is a solid
3. Balance: H2SO4 + 2 NaOH 🡪 Na2SO4 + 2H2O