Coastline College Dupon

## Homework Set 5

(Distributed 10/5/16; Due on 10/12/16)

**Read Chapter 8** in Zumdahl and complete the listed questions from the text: (8E and 7E) Chapter 8: 29, 33, 38, 42, 46, 55, 58, 70; as well as the following problems:

A. Calculate the molar mass for each of the molecules below: (i)  $AI_3(PO_4)_2$  (ii)  $C_{12}H_{22}O_{11}$  (sucrose)

(iii) Ca(HCO<sub>3</sub>)<sub>2</sub>

(iv)  $C_6H_{14}N_2O_2$  (lysine)

| Substance        | Mass, grams | Molecular or<br>formula mass | # moles | # molecules or<br>formula units |
|------------------|-------------|------------------------------|---------|---------------------------------|
| MgCl₂            | 21.7        |                              |         |                                 |
| K₂Se             |             |                              | 5.61    |                                 |
| $Ba_3(PO_4)_2$   |             |                              | 0.032   |                                 |
| $C_3H_7O_2N$     | 0.074       |                              |         |                                 |
| $C_7H_6(NO_2)_2$ |             |                              |         | 8.43 x 10 <sup>26</sup>         |

**B.** Complete the table:

**C.** An organic compound used in food flavoring is 40.67% carbon, 5.08 % hydrogen and 54.25 % oxygen. What is the empirical formula for this compound? If its molecular mass is found to be 124 g/mole, what is its molecular formula?

**D.** Nitrous oxide, or "laughing gas", is prepared by the thermal decomposition of ammonium nitrate:

 $NH4NO_3$  -----> N2O +  $H_2O$ 

Balance the equation and predict how many moles of nitric oxide and moles of water will be prepared from 1 kg of ammonium nitrate