

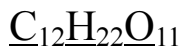
Mole HW #4 **ANSWERS**

1. You have a balloon containing 302 liters of pure nitrogen gas at STP. What does the gas weigh?

$$\frac{302 \text{ L N}_2}{1} \times \frac{1 \text{ mole N}_2}{22.4 \text{ L N}_2} = 13.5 \text{ moles N}_2$$

$$\frac{13.5 \text{ moles N}_2}{1} \times \frac{28 \text{ g N}_2}{1 \text{ mole N}_2} = 378 \text{ grams N}_2 \text{ gas}$$

2. You love to snack on sucrose laden products like other normal teenager (if any exist at all!). There are 185 grams of this $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ sucrose in a cake that you just ate. Of that mass, how many grams were just carbon?



C $12 \times 12\text{g} = 144 \text{ g}$ C $\frac{144 \text{ g}}{342 \text{ g}} \times 100\% = 42.1\%$

H $22 \times 1\text{g} = 22 \text{ g}$ H $\frac{22 \text{ g}}{342 \text{ g}} \times 100\% = 6.43\%$

O $11 \times 16\text{g} = 176 \text{ g}$ O $\frac{176 \text{ g}}{342 \text{ g}} \times 100\% = 51.5\%$

342 g/mole

100%

Carbon: 185 grams sugar X .421 = 77.9 grams just carbon

3. Write the empirical formula for each listed compound.

