

Mole HW #3 **ANSWERS**

1. You find a jar containing 209 grams of sodium hypochlorite. How many formula units did you find?
The molar mass of NaClO is 74 g/mole

$$\frac{209 \text{ g}}{1} \times \frac{1 \text{ MOLE NaClO}}{74 \text{ g NaClO}} = 2.82 \text{ moles NaClO, then...}$$

$$\frac{2.82 \text{ moles NaClO}}{1} \times \frac{6.02 \times 10^{23} \text{ F.U. NaClO}}{1 \text{ mole NaClO}} = 16.9764 \times 10^{23} = 1.70 \times 10^{24} \text{ FU NaClO}$$

2. You have 625.0 grams oxygen difluoride gas at STP. What is the percent composition by mass of it?
How many grams are oxygen, how many grams are fluorine? [round to nearest whole number of grams]

<p>OF₂</p> <p>Oxygen 1 x 16 = 16 Fluorine 2 x 19 = <u>38</u></p> <p style="text-align: right;">54 g/mole</p>	<p>% Comp by Mass</p> <p>Oxygen 16/54 x 100% = 30% oxygen</p> <p>Fluorine 38/54 x 100% = 70% fluorine</p>
<p><i>oxygen</i></p> <p>625.0 grams x .30 = 188 grams oxygen</p>	<p><i>fluorine</i></p> <p>625.0 grams x .70 = 438 grams fluorine</p>

3. You have 244 grams of tantalum bromide. How many grams are tantalum, how many are bromine?
[round to nearest whole number of grams]
TaBr₅. Tantalum only makes a +5 cation so no Roman Numeral is required.

<p>TaBr₅</p> <p>Tantalum 1 x 181 = 181 Bromine 5 x 80 = <u>400</u></p> <p style="text-align: right;">581 g/mole</p>	<p>% Comp by Mass</p> <p>Tantalum 181/581 x 100% = 31% tantalum</p> <p>Bromine 400/581 x 100% = 69% bromine</p>
<p><i>Tantalum</i></p> <p>244 grams x .31 = 76 grams tantalum</p>	<p><i>Bromine</i></p> <p>244 grams x .69 = 168 grams bromine</p>