

## Worksheet 3.5: Mole Reaction Equations

REMEMBER to start by balancing the equations!

1	$\text{C}_2\text{H}_6$	+	$\text{O}_2$	$\rightarrow$	$\text{CO}_2$	+	$\text{H}_2\text{O}$
a)	10. moles						
b)					0.20 moles		

*Parts a) and b) are completely separate (unrelated) scenarios*

2	$\text{Mg}_3\text{N}_2$	+	$\text{H}_2\text{O}$	$\rightarrow$	$\text{Mg}(\text{OH})_2$	+	$\text{NH}_3$
a)							0.48 moles
b)	36 moles						

**For each of the following word problems, you should SHOW your CHECK of the LAW of CONSERVATION of MASS.**

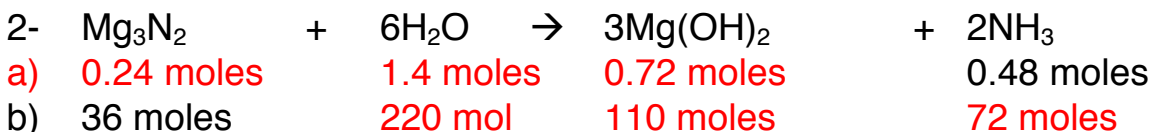
3- A reaction between tin and oxygen produced 68.6 g of  $\text{SnO}_2$  (the only product). How many grams of tin and oxygen were involved?

4- A reaction between phosphorus and hydrogen yielded 10.5 g of phosphorus trihydride. How many grams of phosphorus and hydrogen were needed for the reaction?

5- Zinc and sulphur combine chemically to produce  $\text{ZnS}$ . How many grams of *the sulphide* are produced if 25.9 g of zinc reacts with sulphur? How many grams of sulphur were needed?

6- In the thermite process, aluminum reacts with  $\text{Fe}_3\text{O}_4$  to give  $\text{Al}_2\text{O}_3$  and iron. We will learn, in Chemistry 11, that compounds with unpredictable charges, such as in the  $\text{Fe}_3\text{O}_4$ , are completely possible!  
If 40.2 g of iron are produced, find the masses of the other chemicals involved.

### Wkst 3.5: Mole Reaction Equations ANSWER KEY



3. ? Moles of  $\text{SnO}_2 = (1 \text{ mole} / 151 \text{ g}) (68.6 \text{ g}) = 0.454 \text{ moles SnO}_2$



?g $\text{O}_2 = (32.0\text{g/mole})(0.454\text{moles}) = 14.5\text{g O}_2$

?gSn=(119g/mole)(0.454moles)=54.0g Sn

Check:

$\Sigma \text{ mass of reactants} = \Sigma \text{ mass of products}$

54.0g+14.5g=68.6g

68.5g=68.6g

Good!

4. The reaction needed 9.59 g of phosphorus  
and 0.937 g of hydrogen.

5. 12.7 g of sulphur were required to react with the zinc to produce  
38.6 g of zinc sulphide.

6. Mass of Al=17.3g    Mass of  $\text{Fe}_3\text{O}_4 = 55.4 \text{ g}$     Mass of  $\text{Al}_2\text{O}_3 = 32.6 \text{ g}$