Worksheet 3.5: Mole Reaction Equations

REMEMBER to start by balancing the equations!

1	C_2H_6	+	O_2	→	CO_2	+	H_2O
a)	10. moles						
b)					0.20 moles		

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

2	Mg_3N_2	+	H_2O	→	$Mg(OH)_2$	+	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 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 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 Fe_3O_4 to give Al_2O_3 and iron.
We will learn, in Chemistry 11, that compounds with unpredictable charges, such as in the Fe_3O_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

1-	$2C_2H_6$	+	$7O_2$	→	$4CO_2$	+	$6H_2O$
a)	10. moles		35 moles		20. moles		30. moles
b)	0.10 moles		0.35 moles		0.20 moles		0.30 moles

2-	Mg_3N_2	+	$6H_2O$	→	$3Mg(OH)_2$	+	$2NH_3$
a)	0.24 moles		1.4 moles		0.72 moles		0.48 moles
b)	36 moles		220 mol		110 moles		72 moles

3. ? Moles of SnO_2 = (1 mole / 151 g) (68.6 g) = 0.454 moles SnO_2

Sn	+	O_2	→	SnO_2
0.454 moles		0.454 moles		0.454 moles

?gO_2 =(32.0g/mole)(0.454moles)=14.5g O_2
?gSn=(119g/mole)(0.454moles)=54.0g Sn

Check:
Σ mass of reactants = Σ 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 Fe_3O_4 = 55.4 g Mass of Al_2O_3 = 32.6 g