



Name HINTS
 Period _____

Special announcement: We have Test 3 this Friday and Test 4 on April 8. Since this is short notice, here is an enticement: If you do better on Test 4 than on Test 3, I will record the Test 4 grade for both tests. This can only help you, not hurt you.

INSTRUCTIONS! For each of the problems below:
 a. Write the balanced chemical equation.
 b. Identify what is given (with units) and what you want to find (with units).
 c. Use coefficients from balanced equation to translate sideways
 d. If you do math, show it.

1. Hydrogen sulfide gas, which smells like rotten eggs, burns in air to produce sulfur dioxide and water. How many moles of oxygen gas would be needed to completely burn 8 moles of hydrogen sulfide?

Equation	<u> </u> H ₂ S _(g)	+ <u> </u> O _{2(g)}	→	<u> </u> SO _{2(g)}	+ <u> </u> H ₂ O _(g)
Before	<u> </u>	<u> </u>		<u> </u>	<u> </u>
Change	<u> </u>	<u> </u>		<u> </u>	<u> </u>
After	<u> </u>	<u> </u>		<u> </u>	<u> </u>

① balance it
 ② write minus or plus for each.
 ③ write the change for H₂S is minus 8 moles
 ④ Use coefficients from the balanced equation to get all of the other "change lines".
 ⑤ Simple adding and subtracting will give all of the before and afters. Some before and afters will be zero.

2. Propane, C₃H₈, burns in air to form carbon dioxide and water. If 12 moles of carbon dioxide

3. Ammonia, NH₃, for fertilizer is made by causing hydrogen and nitrogen to react at high temperature and pressure. How many moles of ammonia can be made from 0.15 moles of nitrogen gas?

Equation:	3 H ₂	+ 1 N ₂	→	2 NH ₃
Before	?	0.15 moles		zero
Change	(-0.45)	(-0.15 mol)		(+0.30 mol)
After				0.30 mol NH ₃ GOAL

$$0.15 \text{ mol N}_2 \times \left(\frac{3 \text{ mol H}_2}{1 \text{ mol N}_2} \right) = 0.45 \text{ mol H}_2$$

4. The poison gas phosgene, COCl₂, reacts with water in the lungs to form hydrochloric acid and carbon dioxide. How many moles of hydrochloric acid would be formed by 0.835 moles of phosgene?

You may find these two solved problems from Friday's notes useful in solving tonight's Eleanor Roosevelt homework:

Mole Ratios

Lead will react with hydrochloric acid to produce lead (II) chloride and hydrogen gas. How many moles of hydrochloric acid are needed to completely react with 4.0 mole of lead?

Equation: $1\text{Pb} + 2\text{HCl} \rightarrow 1\text{PbCl}_2 + 1\text{H}_2$

Before	4.0 moles	8.0 moles	ZERO moles	ZERO moles
Change	-4.0 moles	-8.0 moles	+4.0 moles	+4.0 moles
After	Zero	Zero	4.0 moles	4.0 moles

How many moles of hydrogen gas will be produced if 2.5 moles of calcium hydride react according to the following equation?

$$\text{CaH}_2 + 2\text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + 2\text{H}_2$$

Before	2.5 moles	Zero	Zero	
Change	minus 2.5 mol	minus 5.0 mol	plus 2.5 mol	plus 5.0 mol
After	Zero	2.5 moles	5.0 moles	

How many moles of water will be produced if 0.45 mol of