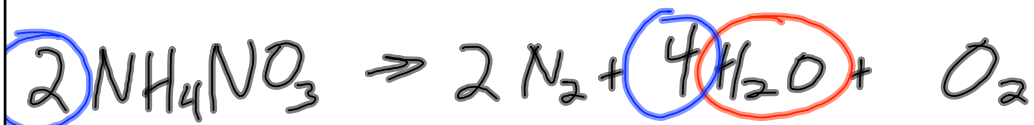
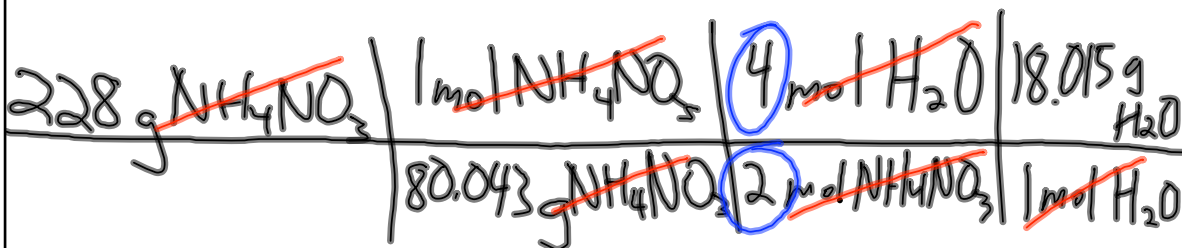


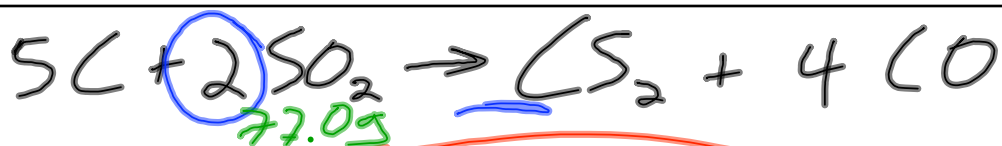
Stoichiometry practice:



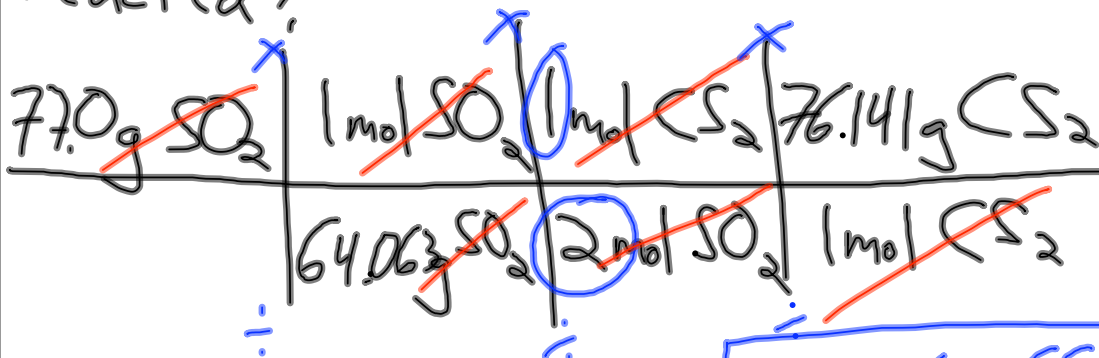
How much water will be formed when 228 g NH₄NO₃ undergoes decomposition?



$$= 102 \text{ g H}_2\text{O}$$



How much carbon disulfide is formed when 77.0 g of sulfur dioxide is reacted?



$$= 45.76 \text{ g CS}_2$$

$$\text{Zn} + \text{CuCl}_2 \rightarrow \text{ZnCl}_2 + \text{Cu}$$

58.3g

If we react 58.3g zinc in copper (II) chloride, how much zinc chloride will we form?

58.3g Zn	 1 mol Zn	 1 mol ZnCl₂	 136.286g ZnCl₂
65.38g Zn	 1 mol Zn	 1 mol ZnCl₂	 1 mol ZnCl₂
÷	÷	÷	÷
			= 121.5g ZnCl₂

$$5\text{F}_2 + 2\text{NH}_3 \rightarrow \text{N}_2\text{F}_4 + 6\text{HF}$$

If 63.2g fluorine^{gas} is reacted with ammonia, how much dinitrogen tetrafluoride is formed?

63.2g F₂	 1 mol F₂	 1 mol N₂F₄	 104.006g N₂F₄
37.996g F₂	 5 mol F₂	 1 mol N₂F₄	 1 mol N₂F₄
			= 34.59g N₂F₄

Limiting Reagents:

- when a chemical reaction occurs between two or more reactants....

- one chemical is used up entirely (limiting reagent)
- any others are not fully reacted (excess)

paraffin + oxygen gas → CO₂ + water



limiting reagent excess

↳ chemical that stops (limits) the reaction when it runs out

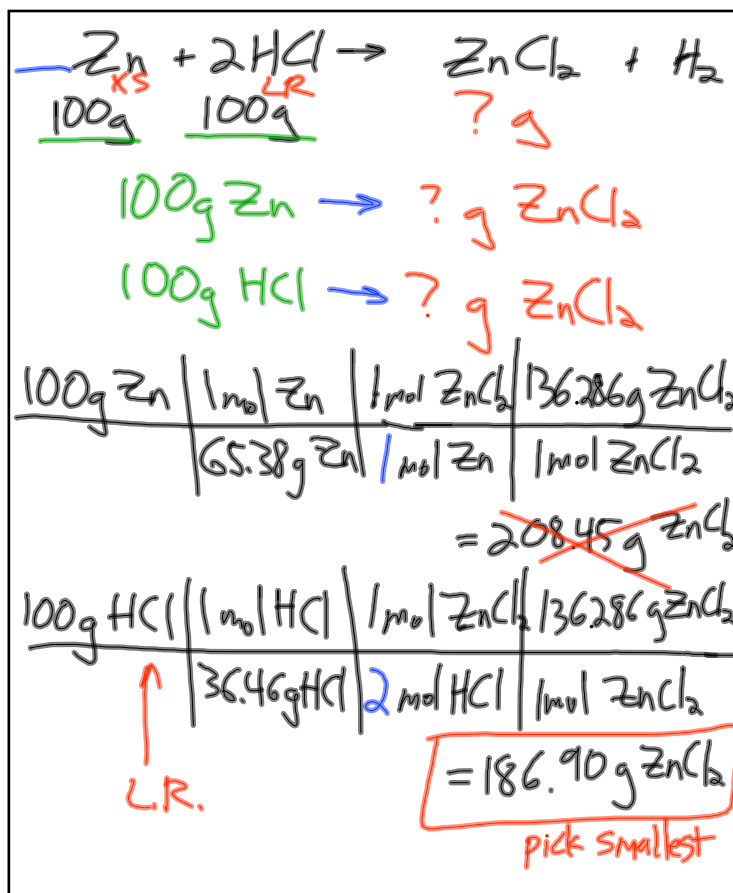
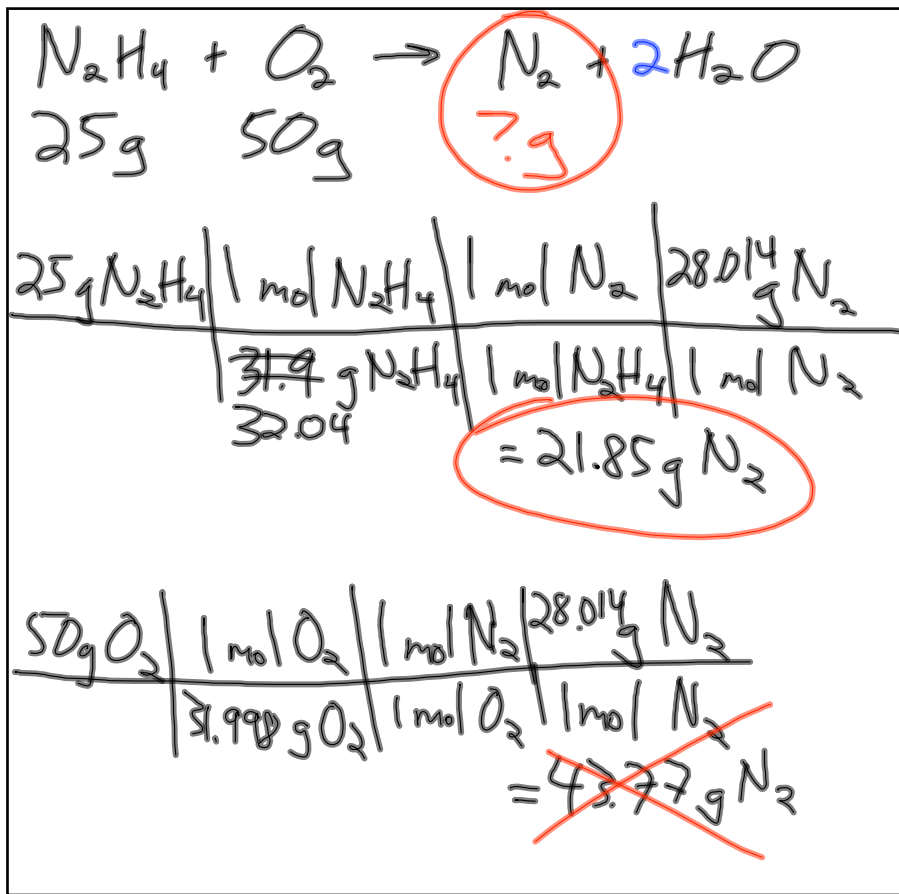
$$SiO_2 + 3C \rightarrow SiC + 2CO$$

$$\begin{array}{ccc} LR & & XS \end{array}$$

100g SiO₂ reacts with 100g carbon;
 how much **SiC** is formed?

100g SiO₂ → ? g SiC
 100g C → ? g SiC ^{> smallest?}

100g SiO ₂	1 mol SiO ₂	1 mol SiC	40.097g SiC
↑ L.R.	60.084g SiO ₂	1 mol SiO ₂	1 mol SiC
			= 66.7 g SiC _{smallest}
100g C	1 mol C	1 mol SiC	40.097g SiC
↑ XS	12.011g C	3 mol C	1 mol SiC
			= 111 g SiC



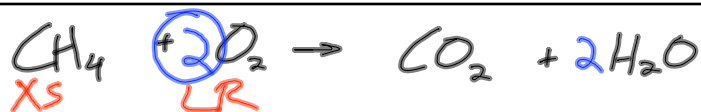


If 550 g Al₂O₃ is reacted with 40 g of carbon, how much aluminum will be formed?

550 g Al ₂ O ₃	1 mol Al ₂ O ₃	2 mol Al	26.982 g Al
	101.961 g Al ₂ O ₃	1 mol Al ₂ O ₃	1 mol Al
			= 291.09 g Al

40 g C	1 mol C	2 mol Al	26.982 g Al
	12.011 g C	3 mol C	1 mol Al
			= 59.9 g Al

LR



If 100. g CH₄ reacts with 100. g O₂, how much CO₂ will be formed?

✓ 100. g CH₄ → ? g CO₂ } smallest?
 100. g O₂ → ? g CO₂ } smallest?

100. g CH ₄	1 mol CH ₄	1 mol CO ₂	44.009 g CO ₂
	16.04 g CH ₄	1 mol CH ₄	1 mol CO ₂
			= 274.37 g CO₂

LR - produces smaller #

100. g O ₂	1 mol O ₂	1 mol CO ₂	44.009 g CO ₂
	31.998 g O ₂	2 mol O ₂	1 mol CO ₂
			= 68.77 g CO₂

$$5C + 2SO_2 \rightarrow CS_2 + 4CO$$

475g C 132g LR ?g

475g C	1 mol C	1 mol CS ₂	76.143g CS ₂
	12.011g C	5 mol C	1 mol CS ₂
			= 602g CS₂

132g SO ₂	1 mol SO ₂	1 mol CS ₂	76.143g CS ₂
	64.064g SO ₂	2 mol SO ₂	1 mol CS ₂
			= 78.4g CS₂

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

If we react 50g CH₄ with 50g O₂, how many grams of CO₂ will we form?

50g CH₄ → ?g CO₂
 50g O₂ → ?g CO₂

50g CH ₄	1 mol CH ₄	1 mol CO ₂	44.009g CO ₂
	16.043g CH ₄	1 mol CH ₄	1 mol CO ₂
			= 137.2g CO₂

LR = produces less

50g O ₂	1 mol O ₂	1 mol CO ₂	44.009g CO ₂
	31.998g O ₂	2 mol O ₂	1 mol CO ₂
			= 34.38g CO₂