

LIMITING REACTANTS (Honors Chemistry)



1a.) If you start with 14.8 g of C_3H_8 and 3.44 g of oxygen gas, which is the limiting reagent?

$$\frac{14.8 \text{ g C}_3\text{H}_8}{44\text{-g}} \times \frac{1 \text{ mol}}{1 \text{ mol C}_3\text{H}_8} \times \frac{5 \text{ mol O}_2}{5 \text{ mol O}_2} \times 32\text{-g} = 53.8\text{-g O}_2$$

LR = O₂

$$\frac{3.44\text{-g O}_2}{32\text{-g}} \times \frac{1 \text{ mol}}{5 \text{ mol O}_2} \times \frac{1 \text{ mol C}_3\text{H}_8}{1 \text{ mol C}_3\text{H}_8} \times 44\text{-g} = .94\text{-g C}_3\text{H}_8$$

1b.) Using the information in question 1a, determine the number of moles of carbon dioxide that can be produced.

$$\frac{3.44 \text{ g O}_2}{32\text{-g}} \times \frac{1 \text{ mol O}_2}{5 \text{ mol O}_2} \times \frac{3 \text{ mol CO}_2}{1 \text{ mol C}_3\text{H}_8} = 6.45 \times 10^{-2} \text{ mol CO}_2$$

1c.) Using the information in question 1a, determine the mass of water that can be produced.

$$\frac{3.44\text{-g O}_2}{32\text{-g}} \times \frac{1 \text{ mol O}_2}{5 \text{ mol O}_2} \times \frac{4 \text{ mol H}_2\text{O}}{1 \text{ mol C}_3\text{H}_8} \times 18\text{-g H}_2\text{O} = 1.55\text{-g H}_2\text{O}$$

1d.) Using the information in question 1a, determine the mass of the excess reagent.

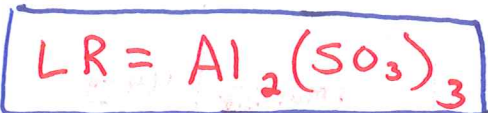
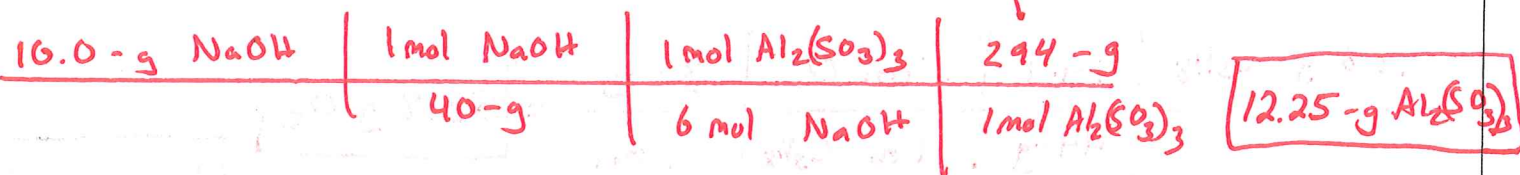
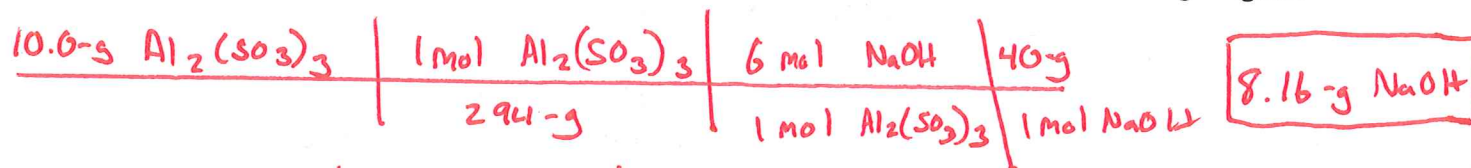
Started with: 14.8-g
Used: .94-g

ER = C₃H₈

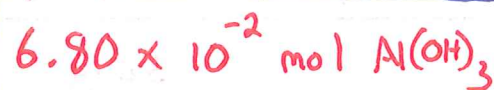
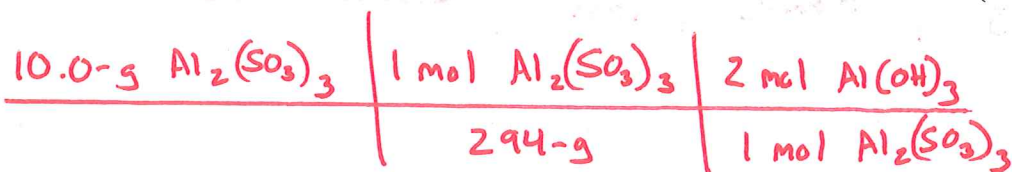
13.86 -g C₃H₈ in Excess



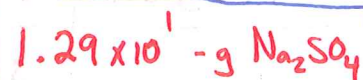
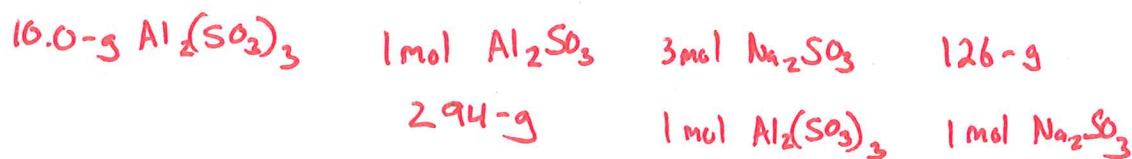
2a.) If 10.0 g of aluminum sulfite reacts with 10.0 g of sodium hydroxide, what is the limiting reagent?



2b.) Using the information in question 2a, determine the number of moles of $\text{Al}(\text{OH})_3$ that can be produced



2c.) Using the information in question 2a, determine the mass of sodium sulfite that can be produced.

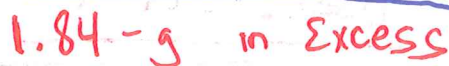


2d.) Using the information in question 2a, determine the mass of the excess reagent.



Started: 10.0-g

Used: 8.16-g





3a.) If 25.4 g of aluminum oxide is reacted with 10.2 g of iron, what is the limiting reagent?

25.4 -g Al_2O_3	1 mol Al_2O_3	9 mol Fe	56 -g Fe	31.4 -g Fe
	102 -g	4 mol Al_2O_3	1 mol Fe	

10.2 -g Fe	1 mol Fe	4 mol Al_2O_3	102 g Al_2O_3	8.26 -g Al_2O_3
	56 -g	9 mol Fe	1 mol Al_2O_3	

$$\text{LR} = \text{Fe}$$

3b.) Using the information in question 3a, determine the number of moles of aluminum produced.

10.2 -g Fe	1 mol Fe	8 mol Al	=
	56 -g	9 mol Fe	

$$1.62 \times 10^{-1} \text{ mol Al}$$

3c.) Using the information in question 3a, what is the mass of Fe_3O_4 that can be produced?

10.2 -g Fe	1 mol Fe	3 mol Fe_3O_4	232 -g
	56 -g	9 mol Fe	1 mol Fe_3O_4

$$1.41 \times 10^1 \text{ g Fe}_3\text{O}_4$$

3d.) Using the information in question 3a, determine the mass of the excess reagent.

$$\text{ER} = \text{Al}_2\text{O}_3$$

Started with : 25.4 -g

Used : 8.26 -g

$$17.14 \text{ -g Al}_2\text{O}_3 \text{ in Excess}$$



4a.) What is the limiting reagent when 15.0 g of carbon disulfide reacts with 35.0 g of oxygen gas?

15.0-g CS ₂	1 mol CS ₂	2 mol O ₂	32-g	12.6-g O ₂
	76-g	1 mol CS ₂	1 mol O ₂	

35.0-g O ₂	1 mol O ₂	1 mol CS ₂	76-g	41.6-g CS ₂
	32-g	2 mol O ₂	1 mol CS ₂	

$$\text{LR} = \text{CS}_2$$

4b.) Using the information in 4a, how many grams of carbon can be produced?

15.0-g CS ₂	1 mol CS ₂	1 mol C	12-g	=
	76-g	1 mol CS ₂	1 mol C	

$$2.37\text{-g C}$$

4c.) Using the information in 4a, how many grams of sulfur dioxide can be produced?

15.0-g CS ₂	1 mol CS ₂	2 mol SO ₂	64-g
	76-g	1 mol CS ₂	1 mol SO ₂

$$2.53 \times 10^1\text{-g SO}_2$$

Using the information in 4a, determine the mass of the excess reagent.

Started With : 35.0-g

Used : 12.6-g



$$22.4\text{-g O}_2 \text{ in Excess}$$