

Mass-Mass Practice (#3)

and related topics such as mass → mol and mol → mol, from ChemTeam.com

Complete the following 10 problems: #1 bd; 2 ab, 3ac, 4a, 5a, 6b, 8b

You may do the rest, but the others are not mandatory.

- 1) $4 \text{FeCr}_2\text{O}_7 + 8 \text{K}_2\text{CO}_3 + \text{O}_2 \rightarrow 2 \text{Fe}_2\text{O}_3 + 8 \text{K}_2\text{CrO}_4 + 8 \text{CO}_2$**
 - (a) How many grams of FeCr_2O_7 are required to produce 44.0 g of CO_2 ?
 - (b) How many grams of O_2 are required to produce 100.0 g of Fe_2O_3 ?**
 - (c) If 300.0 g of FeCr_2O_7 react, how many g of O_2 will be consumed?
 - (d) How many g of Fe_2O_3 will be produced from 300.0 g of FeCr_2O_7 ?**
 - (e) How many grams of K_2CrO_4 are formed per gram (exactly 1 g) of K_2CO_3 used?
- 2) Given the reaction $\text{S} + \text{O}_2 \rightarrow \text{SO}_2$**
 - (a) **How many grams of sulfur must be burned to give 100.0 g of SO_2 ?**
 - (b) How many grams of oxygen will be required for the reaction in part (a)?**
- 3) $6 \text{NaOH} + 2 \text{Al} \rightarrow 2 \text{Na}_3\text{AlO}_3 + 3 \text{H}_2$**
 - (a) **How much aluminum, in grams, is required to produce 17.5 g of hydrogen?**
 - (b) How much Na_3AlO_3 , in g, can be formed from 165.0 g of sodium hydroxide?
 - (c) How many moles of NaOH are required to produce 3 g of hydrogen?**
 - (d) How many mol of hydrogen can be prepared from 1 gram of aluminum?
- 4) $\text{BaO} + \text{H}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + \text{H}_2\text{O}$**
 - (a) **How much BaSO_4 , in g, can be formed from 196.0 g of H_2SO_4 ?**
 - (b) If 81.00 g of water is formed during this reaction, how much BaO , in g, was used?
- 5) $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$**
 - (a) **78.00 g of NaCl should produce how many grams of AgCl ?**
 - (b) How much AgCl , in grams, can be produced from 107.0 g of AgNO_3 ?
- 6) $\text{B}_2\text{O}_3 + 3 \text{Mg} \rightarrow 3 \text{MgO} + 2\text{B}$**
 - (a) How much boron, in grams, can be obtained from 10.00 grams of B_2O_3 ?
 - (b) How much magnesium, in g, is required to produce 400.0 grams of boron?**
- 7) SnO_2 is reduced by carbon according to the this reaction: $\text{SnO}_2 + \text{C} \rightarrow \text{Sn} + \text{CO}_2$**
 - (a) How many grams of CO_2 are formed when 1.00 gram of tin is produced?
 - (b) How much SnO_2 (grams) is required to produce 6.00 grams of tin?
 - (c) How much tin (in grams) is produced per gram (exactly 1 gram) of carbon used?
- 8) $2 \text{KMnO}_4 + \text{H}_2\text{SO}_4 \rightarrow \text{K}_2\text{SO}_4 + \text{Mn}_2\text{O}_7 + \text{H}_2\text{O}$**
 - (a) How many moles of Mn_2O_7 can be formed from 196.0 g of KMnO_4 ?
 - (b) How many grams of Mn_2O_7 can be formed from 390.0 g of KMnO_4 ?**
 - (c) How much H_2SO_4 is needed to produce 27.00 g of water?
- 9) Determine moles of barium bromate [$\text{Ba}(\text{BrO}_3)_2$] that can be prepared from 7.000 moles each of HBrO_3 and $\text{Ba}(\text{OH})_2$, given this equation: $2\text{HBrO}_3 + \text{Ba}(\text{OH})_2 \rightarrow \text{Ba}(\text{BrO}_3)_2 + 2\text{H}_2\text{O}$**
(Hint: calculate two separate answers.)
- 10) Determine moles of Na_2S that can be prepared by the reaction of 0.2240 moles of sodium with excess sulfur. $16 \text{Na} + \text{S}_8 \rightarrow 8 \text{Na}_2\text{S}$**