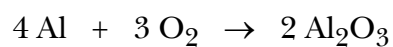


4. How many neutrons are there in 1.00 lb of Cu-65?
5. A compound contains 10.43 g of carbon, 2.63 g of hydrogen, and 6.95 g of oxygen. If the molar mass of the compound is 184.0 g, what is the formula of the compound?
6. Using the chemical equation below, determine how many grams of oxygen would be required to react with 3.5 lb of aluminum.



7. In the equation in problem 6, if 100.0 g of aluminum are reacted, what is the theoretical yield of aluminum oxide. If the percent yield of this reaction is 78%, what will the actual yield be?

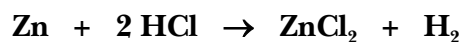
8. Draw Lewis structures for the following compounds and indicate the approximate bond angles.



9. Name the following compounds.



10. On a secret rescue mission in an unfriendly country, MacGyver has parachuted into the jungle at the edge of a city, bringing with him a two-man balloon and several tanks of helium with which to inflate it when his mission is complete. Unfortunately, the tanks landed on some rocks and ruptured. Undaunted, Mac makes good the rescue and heads toward a metal plating plant near the edge of the city. Having been a dedicated chemistry student in his youth, Mac realizes that the zinc and hydrochloric acid stored there could be used to make hydrogen gas for the escape balloon. Mac is able to locate 600 kg of zinc. Using the equation below and your own keen understanding of chemistry, answer the following questions.



- a. At STP, will the reaction of 600 kg of zinc produce sufficient hydrogen gas to fill the 200,000 L balloon?
- b. At STP, how many pounds of lift will the balloon have when fully inflated? Assume that the lifting power of a gas is the difference between the mass of the gas and the mass of an equal volume of air.

11. For each of the following situations, state whether energy is *released*, *absorbed*, or *unchanged*, and whether entropy *increases*, *decreases*, or *remains unchanged*.
- An icicle melts in the sun.
 - Writing a letter to a friend
12. State whether the following substances will be more soluble in a polar or nonpolar solvent.
- MnO_2
 - HSiCl_3
 - OF_2
13. Predict the products in each of the following reactions. If no reaction would occur, write N.R. Be sure to balance the equations.
- $\text{Na}_3\text{PO}_4 + \text{CaCl}_2 \rightarrow$
 - $\text{Fe}(\text{OH})_3 + \text{HI} \rightarrow$
14. Identify the following as acids or bases.
- $\text{pOH} = 7.1$
 - H_3AsO_4
 - N_2H_2

15. A solution is prepared by dissolving 36.0 g of sucrose in 164 g of water. The density of the resulting solution is 1.07 g/mL. Calculate the weight percent and molarity of sucrose in the solution. The formula of sucrose is $C_{12}H_{22}O_{11}$.