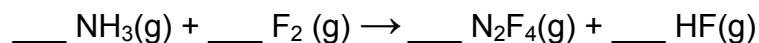


2nd Practice Exam

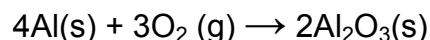
1. What is the formula for ammonium carbonate?
 - a. NH_4CO_3
 - b. NH_4HCO_3
 - c. $(\text{NH}_4)_2\text{CO}_3$
 - d. NH_4CO_2
 - e. NH_4HCO_2
2. Maleic acid, which is used to manufacture artificial resins, has the empirical formula CHO. Its molar mass is 116.1 g/mol. What is its molecular formula?
 - a. CHO
 - b. $\text{C}_2\text{H}_2\text{O}_2$
 - c. $\text{C}_3\text{H}_3\text{O}_3$
 - d. $\text{C}_4\text{H}_4\text{O}_4$
 - e. $\text{C}_6\text{H}_6\text{O}_6$
3. Calculate the empirical formula of a compound which is 51.40% carbon, 8.63% hydrogen, and 39.97% nitrogen.
 - a. $\text{C}_5\text{H}_8\text{N}_2$
 - b. $\text{C}_4\text{H}_9\text{N}_3$
 - c. $\text{C}_2\text{H}_3\text{N}$
 - d. $\text{C}_4\text{H}_6\text{N}_2$
 - e. $\text{C}_3\text{H}_6\text{N}_2$
4. Consider a gold coin which is 90.0% gold and 10.0% copper. If the coin has a mass of 2.00 ounces (56.7 g), how many moles of gold are in the coin?
 - a. 0.0892 mol
 - b. 0.259 mol
 - c. 0.288 mol
 - d. 0.892 mol
 - e. 25.9 mol

5. Ammonia will react with fluorine at a high temperature in the presence of copper to produce some dinitrogen tetrafluoride and hydrogen fluoride.



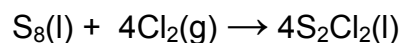
When the equation above is properly balanced with the smallest whole numbers, the respective coefficients are:

- a. 2, 1, 1, 6
 - b. 2, 3, 1, 6
 - c. 2, 5, 1, 6
 - d. 2, 10, 1, 6
 - e. 2, 6, 1, 6
6. Aluminum reacts with oxygen to give aluminum(III) oxide.



If you have 6.0 moles of Al,

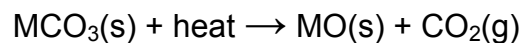
- a. you need 3.0 moles of O_2 for complete reaction and produce 2.0 moles of Al_2O_3 .
 - b. you need 18.0 moles of O_2 for complete reaction and produce 12.0 moles of Al_2O_3 .
 - c. you need 3.0 moles of O_2 for complete reaction and produce 2.0 moles of Al_2O_3 .
 - d. you need 4.5 moles of O_2 for complete reaction and produce 3.0 moles of Al_2O_3 .
 - e. you need 4.5 moles of O_2 for complete reaction and produce 2.0 moles of Al_2O_3 .
7. Disulfur dichloride, S_2Cl_2 , is used to vulcanize rubber. It can be made by treating molten sulfur with gaseous chlorine:



If you use 32.0 g of S_8 and 71.0 g of Cl_2 , what mass of S_2Cl_2 can be produced?

- a. 67.4 g
- b. 135.2 g
- c. 16.9 g
- d. 35.6 g
- e. 103.0 g

8. 1.056 g of metal carbonate, containing an unknown metal M, were heated to give the metal oxide and 0.376 g CO₂.



What is the identity of the metal M?

- a. M = Ni
 - b. M = Cu
 - c. M = Zn
 - d. M = Ba
 - e. M = Mg
9. A 27.0 g sample of an unknown carbon-hydrogen compound was burned in excess oxygen to form 88.0 g of CO₂ and 27.0 g H₂O. What is a possible molecular formula of the hydrocarbon?
- a. CH₄
 - b. C₂H₆
 - c. C₄H₆
 - d. C₄H₈
 - e. C₄H₁₀
10. The chemical properties of germanium would be most similar to
- a. P.
 - b. Ga.
 - c. Si.
 - d. Sb.
 - e. Ho.

11. How many grams of NO_2 contain the same number of molecules as 5.00 grams H_2O ?

- a. 12.8 g
- b. 2.77 g
- c. 5.00 g
- d. 0.391 g
- e. 1.96 g

12. The synthesis of urea, a common fertilizer, is described by the following equation:



When the equation above is properly balanced with the smallest whole numbers, the respective coefficients are:

- a. 2, 3, 2, 4
- b. 1, 2, 1, 1
- c. 2, 4, 2, 2
- d. 1, 4, 2, 2
- e. 2, 3, 2, 3

13. Given the balanced equation: $\text{A} + 3\text{B} \rightarrow 2\text{C}$.

The molar mass of C is 40.0 grams. If one **mole** of A produces 20.0 grams of C, what is the percent yield of the reaction?

- a. 100%
- b. 50%
- c. 25%
- d. 10%
- e. 1.0%