

Chang

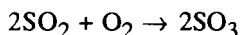
PRACTICE TEST Chpt 3

- If the standard of the atomic mass unit scale had been defined such that a fluorine atom was 10.0 amu, what would the atomic masses of oxygen and argon be?
- How many times heavier are bromine atoms on the average than neon atoms?
- A sample of magnesium could one day be brought back from a planet circling a distant star. What is the atomic mass of this magnesium if it has two isotopes with the following masses and abundances?

magnesium-24	23.985 amu;	18.05%
magnesium-26	25.982 amu;	81.95%
- What is the mass in grams of 1.5×10^{22} molecules of PCl_5 ?
 - What is the mass in grams of 10^{12} carbon atoms?
- What is the mass of a single atom of fluorine in grams?
- How many O atoms are in each of the following amounts?
 - 1 mol ozone, O_3 *4g*
 - 1 mol CuO *5g*
 - 20 g $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ *3g*
- What mass of $\text{Ca}_3(\text{PO}_4)_2$ would contain 0.500 mol Ca?
- How many moles of CaSO_4 are there in 600 g CaSO_4 ?
 - How many moles of oxygen are there in 600 g CaSO_4 ?
 - How many oxygen atoms are in 600 g CaSO_4 ?
- How many antimony atoms are there in 5.00 mol Sb_2O_5 ?
- Answer the following questions concerning sulfur trioxide.
 - What is the mass of 17.5 mol of SO_3 ?
 - What is the mass of 7.5×10^{20} SO_3 molecules?
- What is the empirical formula of each of the following compounds?
 - $\text{C}_6\text{H}_8\text{O}_6$
 - P_4O_{10}
 - MgCl_2
- Calculate the percent composition by mass of the following compounds:
 - Al_2O_3
 - HNO_3
 - CCl_2F_2
- Calculate the percentage of fluorine by mass in the refrigerant HFC-134a. Its formula is $\text{C}_2\text{H}_2\text{F}_4$?
- The empirical formula of styrene is CH , and its molar mass is 104 g/mol. What is its molecular formula?

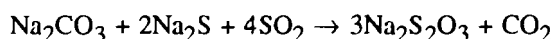
15. Chromic oxide is a compound of chromium and oxygen. Determine the empirical formula of chromic oxide given that 2.00 g of the compound contains 1.04 g Cr.
16. The compound glycerol contains three elements: C, H, and O. When a 0.740 g sample is burned in oxygen, 1.06 g CO₂ and 0.580 g H₂O are formed. What is the empirical formula of glycerol?
17. Balance the following equations:
- $\text{P}_4\text{O}_{10} + \text{H}_2\text{O} \rightarrow \text{H}_3\text{PO}_4$
 - $\text{Ga} + \text{H}_2\text{SO}_4 \rightarrow \text{Ga}_2(\text{SO}_4)_3 + \text{H}_2$
 - $\text{C}_4\text{H}_{10} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

18. Complete lines a, b, and c of the following table for the reaction:



	moles SO ₂	grams O ₂	moles SO ₃	grams SO ₃
a.	1.50	_____	_____	_____
b.	_____	20.0	_____	_____
c.	_____	_____	5.21	_____

19. Sodium thiosulfate, the "hypo" used in photographic developing, can be made by the reaction:



- How many grams of Na₂CO₃ (sodium carbonate) are required to produce 321 g of sodium thiosulfate, Na₂S₂O₃?
 - How many grams of Na₂S are required to react with 25.0 g Na₂CO₃ if SO₂ is present in excess?
20. Hydrofluoric acid (HF) can be prepared according to the following equation:
- $$\text{CaF}_2 + \text{H}_2\text{SO}_4 \rightarrow 2\text{HF} + \text{CaSO}_4$$
- How many grams of HF can be prepared from 75.0 g H₂SO₄ and 63.0 g CaF₂?
 - How many grams of the excess reagent will remain after the reaction ceases?
 - If the actual yield of HF is 26.2 g, what is the percent yield?

General Questions

21. The density of silver is 10.5 g/cm³. How many Ag atoms are present in a silver bar that measures 0.10 m × 0.05 m × 0.01 m?
22. The pesticide malathion has the chemical formula C₁₀H₁₉O₆PS₂.
- What is the molecular mass?
 - The dose that is lethal to 50 percent of a human population is about 1.25 g per kilogram of body mass. How many molecules are in a dose lethal to an adult male weighing 70 kg? To an adult female of 58 kg?