

What is the molar mass of the following compounds? Be sure to include units! (4 points each)

1. NaCl
2. H₂S
3. Fe₃(PO₄)₂
4. (NH₄)₂S

What is the empirical formula for the following molecular formulas (3 points each)

5. SO₂
6. C₂H₄
7. C₃H₈
8. C₆H₁₂

Answer the following questions. Be sure to include units in your answer! (5 points each)

9. How many atoms are in 29.4 amu of calcium?
10. How many atoms are in 489 amu of sulfur?
11. How many atoms in 12.9 moles of lithium?
12. How many atoms in 895 moles of lithium?

13. How many moles are in 35.9 grams of zinc?
14. How many moles are in 5.90 grams of helium?
15. How many moles are present if there are 1.7×10^{27} atoms of lithium?
16. How many moles are present if there are 5.7×10^{15} atoms of sodium?
17. How many grams are in 278 amu of carbon?
18. How many grams are in 893 amu of sulfur?
19. How many molecules of CF_4 are in 15 moles of CF_4 ?
20. How many molecules of BaF_2 are in 15 moles of BaF_2 ?
21. How many moles of CF_4 do I have if I have 5.98×10^{27} molecules of CF_4 ?
22. How many moles of BaF_2 do I have if I have 3.67×10^5 molecules of BaF_2 ?

Answer the following questions. Be sure to include units in your answer! (6 points each)

23. What is the mass in grams of 23.5 moles of CF_4 ?

24. What is the mass in grams of 8.90 moles of BaF_2 ?

25. How many atoms are in 14.0 grams of silver

26. How many atoms are in 289.9 grams of sodium?

27. How many grams do 4.3×10^{20} atoms of boron weigh?

28. How many grams do 1.8×10^{29} atoms of silicon weigh?

Calculate the percent composition for each element in the compound (6 points each)

29. BaCrO_4

Ba _____

Cr _____

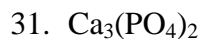
O _____

30. $(\text{NH}_4)_2\text{S}$

N _____

H _____

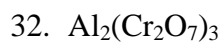
S _____



Ca _____

P _____

O _____



Al _____

Cr _____

O _____

Solve the following problems: (10 points each)

33. If a compound contains 0.0938 grams of carbon and 0.00625 grams of hydrogen?

a. What is the empirical formula of the compound?

b. If the molar mass of the compound is approximately 128 grams/mole, what's the molecular formula?

34. If a compound contains 7.908 grams of carbon, 0.554 grams of hydrogen and 1.538 grams of nitrogen ?

a. What is the empirical formula of the compound?

b. If the molar mass of the compound is approximately 273 grams/mole, what's the molecular formula?

35. If a compound contains 40.00% carbon, 6.713% hydrogen, and 53.28% oxygen:

a. What is the empirical formula of the compound?

b. If the molar mass of the compound is approximately 180 grams/mole, what's the molecular formula?

36. If a compound contains 49.99% carbon, 5.61% hydrogen, and 44.4% oxygen:

c. What is the empirical formula of the compound?

d. If the molar mass of the compound is approximately 72 grams/mole, what's the molecular formula?