

Tutorial 3 : Empirical Formula, Molecular Formula, IUPAC Nomenclature

1. A compound with an empirical formula of C_2OH_4 and a molar mass of 88 grams per mole.
2. A compound with an empirical formula of C_4H_4O and a molar mass of 136 grams per mole.
3. A compound with an empirical formula of $CFBrO$ and a molar mass of 254.7 grams per mole.
4. A compound with an empirical formula of C_2H_8N and a molar mass of 46 grams per mole.
5. The percentage composition of acetic acid is found to be 39.9% C, 6.7% H, and 53.4% O. Determine the empirical formula of acetic acid.
6. What's the empirical formula of a molecule containing 18.7% lithium, 16.3% carbon, and 65.0% oxygen?
7. A 50.51 g sample of a compound made from phosphorus and chlorine is decomposed. Analysis of the products showed that 11.39 g of phosphorus atoms were produced. What is the empirical formula of the compound?
8. When 2.5000 g of an oxide of mercury, (Hg_xO_y) is decomposed into the elements by heating, 2.405 g of mercury are produced. Calculate the empirical formula.
9. The compound benzamide has the following percent composition. What is the empirical formula?
C = 69.40 % H= 5.825 % O = 13.21 % N= 11.57 %
10. A component of protein called serine has an approximate molar mass of 100 g/mole. If the percent composition is as follows, what is the empirical and molecular formula of serine? C = 34.95 % H= 6.844 % O = 46.56 % N= 13.59 %
11. What is empirical formula of a compound which consists of 89.14% Au and 10.80% of O?
12. What is empirical formula if compound consists of 21.2%N, 6.1%H, 24.2%S and 48.5%O?
13. Provide the IUPAC names of the following covalent compounds.

1. CO _____
2. PBr_3 _____
3. CCl_4 _____
4. NCl_3 _____
5. SeO_2 _____
6. P_2O_3 _____
7. SO_3 _____
8. P_2O_5 _____
9. CO_2 _____
10. PI_5 _____
11. SeO_3 _____

12. SiO_2 _____
13. Cl_2O_7 _____
14. SO_2 _____
15. N_2O_3 _____
16. N_3P_2 _____
17. SCl_2 _____
18. SeF_6 _____
19. N_2O_4 _____
20. CS_2 _____
21. H_2S _____
22. CF_4 _____

14. Provide IUPAC names for the following compounds.

1. Ca(OH)_2 _____
2. AlCl_3 _____
3. FeI_2 _____
4. Hg_2Cl_2 _____
5. NaH _____
6. MgCl_2 _____
7. ZnBr_2 _____
8. MnCl_2 _____
9. NH_4Cl _____
10. PbS _____

11. K(CN) _____
12. MgO _____
13. PbCl_2 _____
14. Fe(OH)_3 _____
15. Ag_2O _____
16. HgO _____
17. $(\text{NH}_4)\text{I}$ _____
18. Cu_2O _____
19. Cs_3N _____
20. CuS _____

15. Provide IUPAC names for the following compounds.

1. $\text{Pb(SO}_4\text{)}$ _____
2. $\text{Cd(ClO}_4\text{)}_2$ _____
3. $\text{Li}_2(\text{CrO}_4)$ _____
4. $\text{Ca}_3(\text{PO}_4)_2$ _____
5. NaNO_2 _____
6. $\text{Ba(ClO}_3\text{)}_2$ _____
7. Ca(CN)_2 _____
8. $\text{Cd(NO}_3\text{)}_2$ _____
9. $\text{Al(C}_2\text{H}_3\text{O}_2\text{)}_3$ _____
10. $\text{Fe}_2(\text{SO}_4)_3$ _____
11. $(\text{NH}_4)_2(\text{SO}_3)$ _____
12. $\text{Zn(BrO}_3\text{)}_2$ _____
13. CaCO_3 _____

14. $\text{Cs}_2(\text{Cr}_2\text{O}_7)$ _____
15. $\text{Li}_2(\text{SO}_3)$ _____
16. $\text{Zn(ClO}_3\text{)}_2$ _____
17. $\text{Cd(C}_2\text{H}_3\text{O}_2\text{)}_2$ _____
18. $\text{Na}_3(\text{PO}_4)$ _____
19. Zn(CN)_2 _____
20. $\text{K}_2(\text{CO}_3)$ _____
21. $\text{Li(MnO}_4\text{)}$ _____
22. $\text{Ag}_2(\text{CO}_3)$ _____
23. $(\text{NH}_4)_2\text{S}$ _____
24. $\text{H}_2(\text{SO}_3)$ _____
25. $\text{Sn(CO}_3\text{)}_2$ _____