Empirical and Molecular Formula Worksheet

SHOW WORK ON A SEPARATE SHEET OF PAPER.

Write the empirical formula for the following compounds.

1) C_6H_6

2) C_8H_{18}

3) WO_2

4) $C_2H_6O_2$

5) $X_{39}Y_{13}$

6)   A compound with an empirical formula of C_2OH_4 and a molar mass of 88 grams per mole. What is the molecular formula of this compound?

7)   A compound with an empirical formula of C_4H_4O and a molar mass of 136 grams per mole. What is the molecular formula of this compound?

8)   A compound with an empirical formula of CFBrO and a molar mass of 254.7 grams per mole. What is the molecular formula of this compound?

9)   A compound with an empirical formula of C_2H_8N and a molar mass of 46 grams per mole. What is the molecular formula of this compound?

10)   A well-known reagent in analytical chemistry, dimethylglyoxime, has the empirical formula C2H4NO. If its molar mass is 116.1 g/mol, what is the molecular formula of the compound?

12.   Nitrogen and oxygen form an extensive series of oxides with the general formula N_xO_y. One of them is a blue solid that comes apart, reversibly, in the gas phase. It contains 36.84% N. What is the empirical formula of this oxide?

13.   A sample of indium chloride weighing 0.5000 g is found to contain 0.2404 g of chlorine. What is the empirical formula of the indium compound?

14.   An unknown compound was found to have a percent composition as follows: 47.0 % potassium, 14.5 % carbon, and 38.5 % oxygen. What is its empirical formula? If the true molar mass of the compound is 166.22 g/mol, what is its molecular formula?

15.   Rubbing alcohol was found to contain 60.0 % carbon, 13.4 % hydrogen, and the remaining mass was due to oxygen. What is the empirical formula of rubbing alcohol?

Empirical and Molecular Formula Worksheet ANSWER KEY

Write the empirical formula for the following compounds.

1) C_6H_6 **C_3H_3**

6) C_8H_{18} **C_4H_9**

7) WO_2 **WO_2**

8) $C_2H_6O_2$ **CH_3O**

9) $X_{39}Y_{13}$ **X_3Y**

6)   A compound with an empirical formula of C_2OH_4 and a molar mass of 88 grams per mole. What is the molecular formula of this compound?   **$C_4O_2H_8$**

7)   A compound with an empirical formula of C_4H_4O and a molar mass of 136 grams per mole. What is the molecular formula of this compound?   **$C_8H_8O_2$**

8)   A compound with an empirical formula of CFBrO and a molar mass of 254.7 grams per mole. What is the molecular formula of this compound?   **$C_2F_2Br_2O_2$**

9)   A compound with an empirical formula of C_2H_8N and a molar mass of 46 grams per mole. What is the molecular formula of this compound? **C_2H_8N**

10)   A well-known reagent in analytical chemistry, dimethylglyoxime, has the empirical formula C_2H_4NO. If its molar mass is 116.1 g/mol, what is the molecular formula of the compound? **$C_4H_8N_2O_2$**

12.   A certain blue solid contains 36.84% N. What is the empirical formula of this compound? **The ratios are $N_{1.00}O_{1.50}$. Since 1.50 is not close to a whole number, we multiply *both* subscripts by 2. The empirical formula is thus N_2O_3. (The name is dinitrogen trioxide.)**

13.   A sample of indium chloride weighing 0.5000 g is found to contain 0.2404 g of chlorine. What is the empirical formula of the indium compound? **$InCl_3$**

14.   An unknown compound was found to have a percent composition as follows: 47.0 % potassium, 14.5 % carbon, and 38.5 % oxygen. What is its empirical formula? If the true molar mass of the compound is 166.22 g/mol, what is its molecular formula? **$K_2C_2O_4$**

15.   Rubbing alcohol was found to contain 60.0 % carbon, 13.4 % hydrogen, and the remaining mass was due to oxygen. What is the empirical formula of rubbing alcohol? **C_3H_8O**