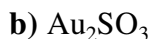


## Problems of Empirical and molecular formula

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1) Calculate the percent by weight of each element present in the following compounds:



2) A compound that consist of carbon, hydrogen, and oxygen has 68.92 % carbon and 12.72 % hydrogen by mass. Determine its empirical formula.

3) A compound that consist of carbon, hydrogen, and oxygen has 53.71 % carbon and 10.52 % hydrogen by mass. Find out its empirical formula and molecular formula if its molar mass is 268.4 g/mol.

4) A compound that consist of carbon, hydrogen, and oxygen has 46.15 % carbon and 7.75 % hydrogen by mass. A vaporized sample at 118 °C and at a pressure of 1.71 atm has a density of 11.1 g/L. Determine its empirical formula and molecular formula.

5) A hydrocarbon has 85.63 % carbon by mass. A vaporized sample at 115 °C and at a pressure of 1.74 atm has a density of 2.3 g/L. Determine its empirical formula and molecular formula.

6) 45 g of a sample of a compound (that consist of carbon, hydrogen, and oxygen) is burned. 78.08 g of  $\text{CO}_2$  and 42.61 g of  $\text{H}_2\text{O}$  are formed. A vaporized sample of 38 g of the compound occupies a volumen of 2.44 L at 99 °C and at a pressure of 1.56 atm. Find out its empirical formula and molecular formula.

7) 17 g of a sample of a compound (that consist of carbon, hydrogen, and oxygen) is burned. 24.51 g of  $\text{CO}_2$  and 12.54 g of  $\text{H}_2\text{O}$  are formed. A vaporized sample at 121 °C and at a pressure of 1.33 atm has a density of 12.6 g/L. Determine its empirical formula and molecular formula.

### Answers:

- 1) a) 37.49 % C, 12.58 % H, 49.93 % O  
 c) 52.14 % C, 13.13 % H, 34.73 % O  
 e) 28.22 % K, 25.59 % Cl, 46.19 % O

- b) 83.11 % Au, 6.765 % S, 10.13 % O  
 d) 33.33 % S, 66.67 % S  
 f) 41.11 % N, 11.83 % H, 47.06 % S

