

## Assignment Twelve

## Percent Composition, Empirical Formulas and Molecular Formulas

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1. A sample of fluid in a lighter was found to contain 85.6% mass of carbon and 14.4% mass of hydrogen. Determine the molecular formula of this compound if the molar mass was found to be 42.09 g/mol. (5 marks)
  2. An unknown carbohydrate was found to have a percent by mass of carbon to be 48.0%, a percent by mass of hydrogen to be 9.4% and a percent by mass of oxygen to be 42.6%. Find the molecular formula of the compound if its molar mass was 75.1 g/mol. (7 marks)
  3. What is the empirical formula of a compound with 93.22% Mn and 6.78% C? (5 marks)
  4. A compound gave, on analysis, the following percentage compositions:  
K = 26.57%      Cr = 35.36%      O = 38.07%  
Determine the empirical formula for the compound. (8 marks)
  5. What is the empirical formula of a compound that is 35.46% nitrogen and 64.54% oxygen? (6 marks)
  6. A compound has a molar mass of 102.00 g/mol. Its composition was found to be 58.8% carbon, 9.9% hydrogen and 31.3% oxygen. Find the molecular formula of this compound. (7 marks)
  7. Calculate the percent composition of the following compounds. (6 each for a total of 24 marks)  
a.  $\text{Li}_3\text{PO}_4$       b.  $\text{H}_2\text{SO}_3$       c.  $\text{Pb}(\text{OH})_2$       d.  $\text{Al}_2(\text{SO}_3)_3$

