

SL & HL Questions on Empirical and molecular formulas

1. 10.000 g of a sample of an oxide of copper was found to contain 8.882 g of copper. Determine the empirical formula of the copper oxide.
2. A salt was found to contain 11.33 % carbon, 43.38 % sodium and 45.29 % oxygen by mass. Determine the empirical formula of the salt.
3. A hydrocarbon contains 92.24 % carbon by mass and has a molar mass of 78.12 g mol^{-1} . Determine the empirical formula and molecular formula of the hydrocarbon.
4. Aspirin contains 60.00 % carbon, 4.48 % hydrogen and 35.52 % oxygen. It has a molar mass of $180.17 \text{ g mol}^{-1}$. Determine the empirical and molecular formula of aspirin.
5. An organic compound has a molar mass less than 100 g mol^{-1} . The percentage composition by mass of this compound is: 71.38 % carbon, 9.60 % hydrogen with the remainder being oxygen. Determine the empirical and molecular formula of this compound.
6. A piece of magnesium with a mass of 5.867 g was heated in a crucible which was open to the air. After the magnesium had combusted and allowed to cool down the product was found to have a mass of 8.956 g.
 - i. Determine the empirical formula of the magnesium oxide formed.
 - ii. The actual empirical formula of magnesium oxide is MgO. Suggest **three** possible reasons why the value obtained in the experiment described above did not produce the correct formula.