**Empirical and Molecular Formula Problems**

1. The insecticide DDT has the following composition by mass: 47.5 % C, 2.54 % H, and

50.0 % Cl. Determine the empirical formula of DDT.

1. A compound gave on analysis the following percent composition: K = 26.57 %,

Cr = 35.36 %, O = 38.07 %. Derive the empirical formula of the compound.

1. A compound has the following percent composition: C = 40.0 %, H = 6.67 %, O = 53.3 %. Its molar mass is 60.0 g/mole. Derive its empirical and molecular formulas.
2. Determine the empirical formula and the molecular formula of a hydrocarbon which has a molar mass of 84.0 grams and contains 85.7 % carbon. (A hydrocarbon is a compound that contains only carbon and hydrogen.)
3. A sample of a pure compound contains 2.04 g of sodium, 2.65 x 1022 atoms of carbon, and 0.132 mole of oxygen atoms. Find the empirical formula. (Think in terms of moles.)
4. A 2.500 g sample of uranium was heated in the air. The resulting oxide weighed 2.949 g. Determine the empirical formula of the compound.
5. Determine the simplest formula of a compound that has the following composition:

Cr = 26.52 %, S = 24.52 %, O = 48.96 %

1. A compound contains 63.1 % carbon, 11.92 % hydrogen, and 24.97 % fluorine. Derive its empirical formula.
2. A compound with a molar mass of about 175 grams/mole consists of 40.0 % carbon,

6.7 % hydrogen, and 53.3 % oxygen. What is the empirical and molecular formula of the compound?