Friday Worksheet **Name: …….**

^{1}HNMR spectroscopy 2

1) An unknown compound was analysed and found to contain the following composition by mass.
   68.2 % carbon, 13.6% hydrogen and 18.2% oxygen
   a) Determine the empirical formula of the compound.
   => mol ratio 68.2 /12.0 : 13.6 / 1.00 : 18.2 / 16.0
   => 5.68 of C : 13.6 of H : 1.14 of O
   => simplest ratio 5 : 12 : 1
   => empirical formula $C_5H_{12}O$
   $C_5H_{12}O$

   b) If a pure 0.100 mol sample of the compound weighs 8.80 grams find the molecular formula.
   step 1 find the molar mass.
   => Molar mass = mass / mol = 8.80 /0.100 = 88.0 g/mol
   Step 2 find the ratio empirical mass : formula mass
   88 : 88 raito of 1: 1
   Molecular formula is
   $C_5H_{12}O$
   c) Below is a ^{1}HNMR spectrum of the compound. Give the structural formula for the compound.