1) A hydrocarbon was analysed and found to contain the following percentage composition by mass, 85.7% carbon and 14.3% hydrogen.

   a) If the molar mass of this compound is 56.0 g/mol calculate its molecular formula.

   b) To what homologous series does this molecule belong?

   c) Write the semi-structural formulae of two possible isomers of this compound.

   b) The compound reacts with Br_2.

      i.   What are the names of two possible products of this reaction?

      ii.   Draw their structural formulae

      iii.   What type of reaction is this?

      Below is the ^{1}HNMR spectrum of a compound with the same molecular formula as the products.

      i.   Draw the structural formula of this compound

      ii.   Explain why this could not be a product of the reaction between the hydrocarbon and the Br_2