A. GC- Mass spectra and Gas-chromatograph studies of catalytic products

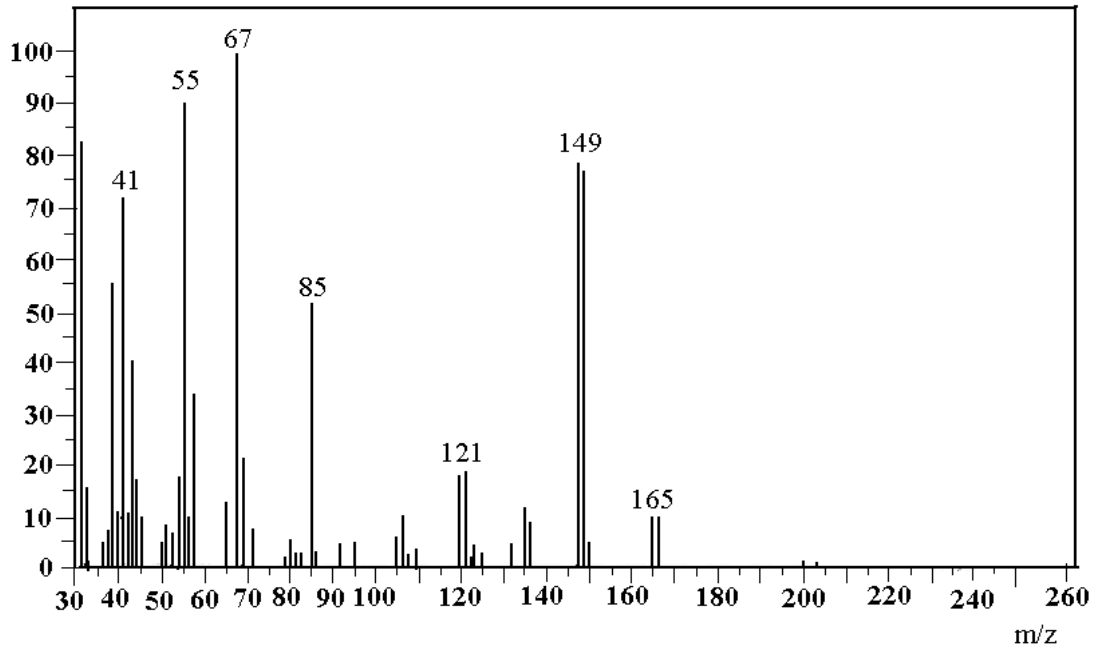

Fig.S1: Mass spectrum of brominated product of 4-pentene 1-ol.

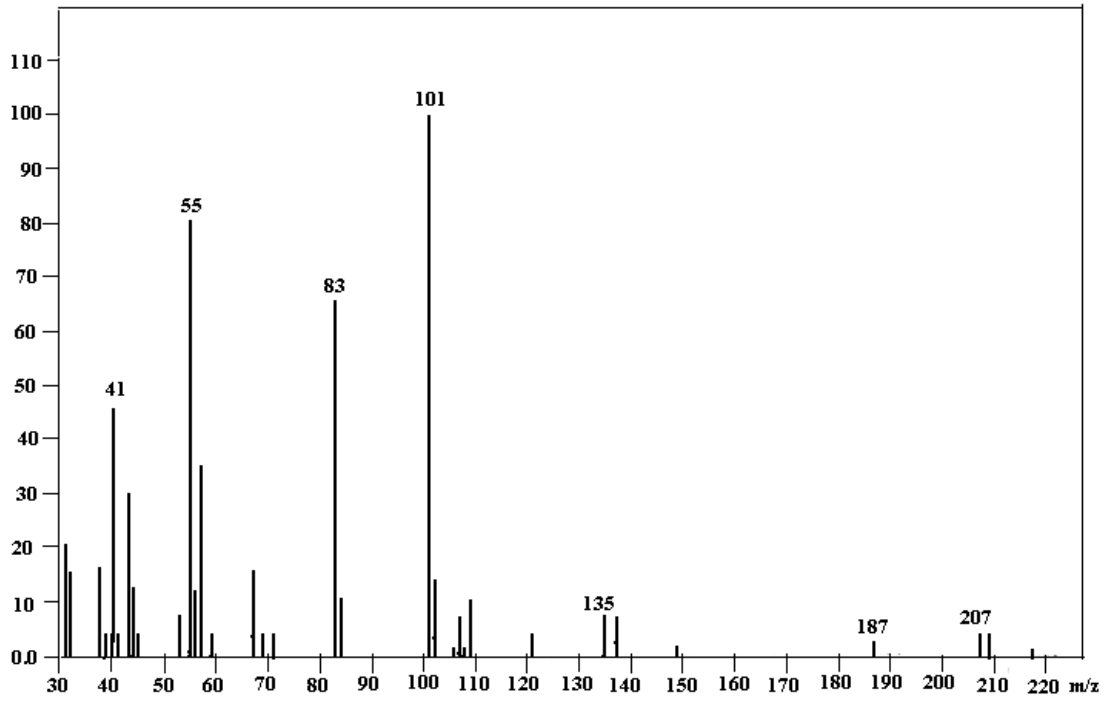

Fig.S2: Mass spectrum of brominated product of 1-octene 3-ol.

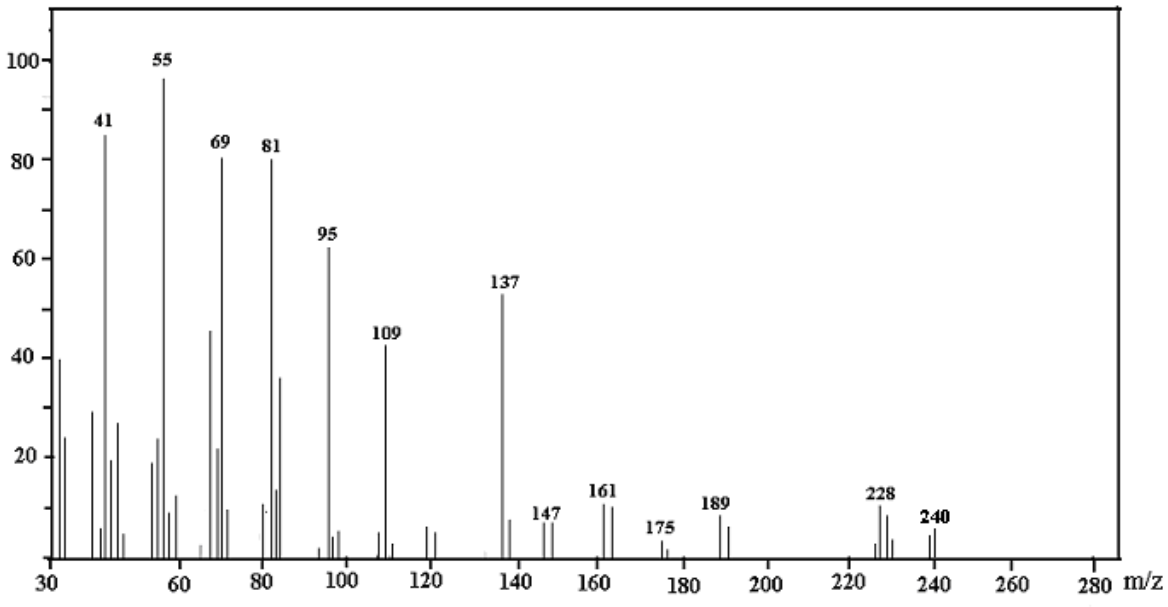

Fig.S3: Mass spectrum of brominated product of 9-decene 1-ol

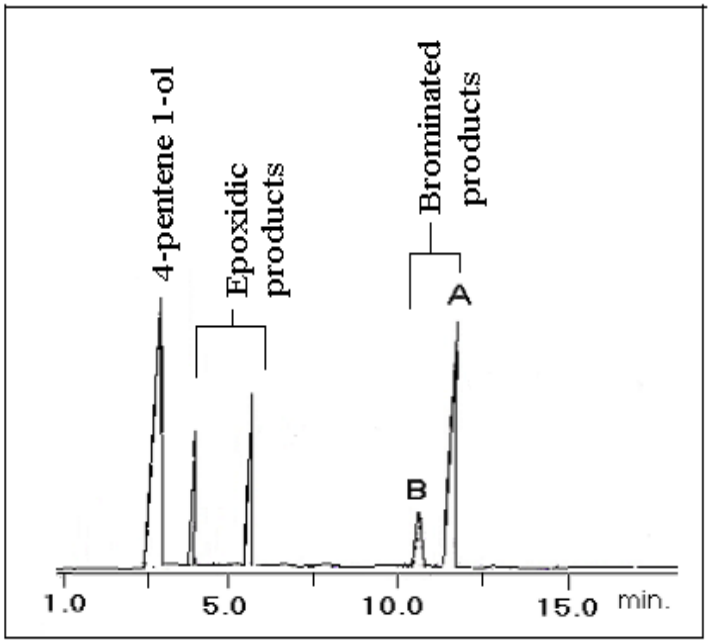

Fig.S4: Retention time of the responding brominated and epoxidic products including the substrate 4-pentene 1-ol in the gas chromatogram.

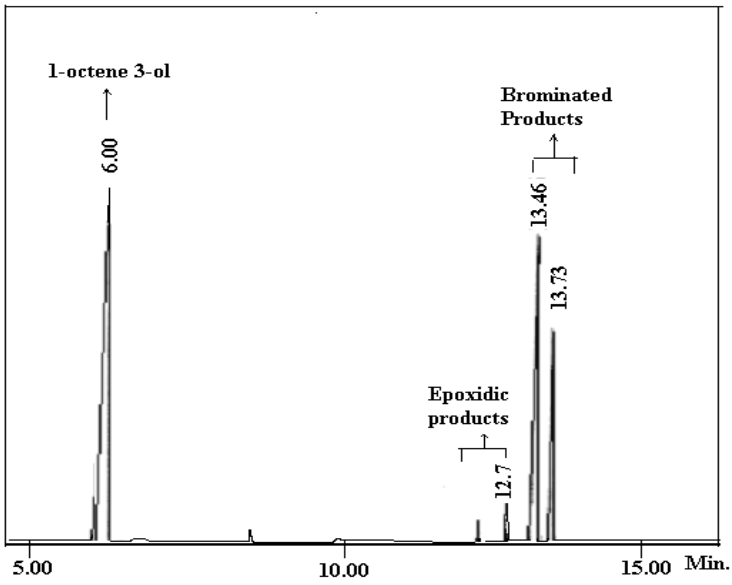

Fig.S5: Retention time of the corresponding brominated and epoxidic products including the substrate 1-octene 3-ol in the gas chromatogram.

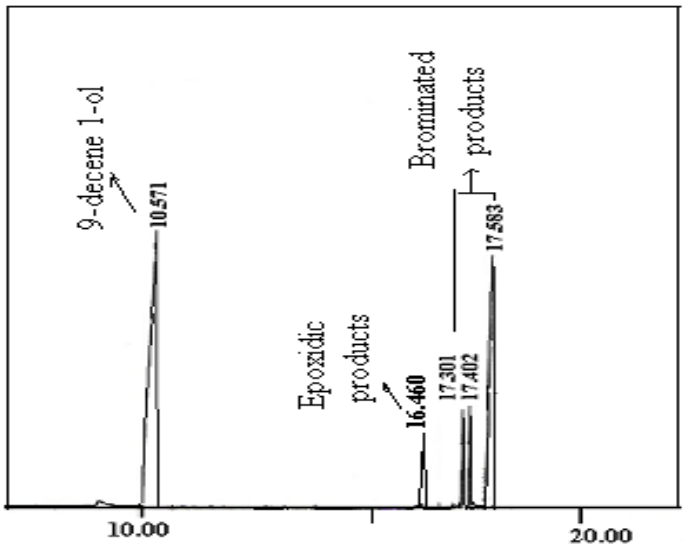

Fig.S6: Retention time of corresponding brominated and epoxidic products including the substrate 9-decen e 1-ol in the gas chromatogram.

B. Method of determination of GC yield:

Firstly response factor needs to be determined.

Let the response factor be F for the alkenols with respect to internal standard. Now, area of alkenol signal / moles of alkenol = F × area of standard signal / moles of standard.

That is, $a_h / m_h = F \times a_s / m_s$.

Therefore, $F = a_h \times m_s / a_s \times m_h$.....(1) where m_h and m_s are the moles of alkenol and that of standard respectively. a_h and a_s are the area of alkenol and that of standard respectively at zero time of the mixing.

This equation presumes a linear response of the detector to both alkenol and the standard. Constancy of F has been checked by varying randomly the moles of alkenols and recording the chromatogram at zero time.

Similarly, a known quantity of oxygenated and brominated product is mixed with the same quantity of the standard as in equation (1) and is chromatographed to find the response factor of this system.

Therefore, $F' = a_{ho} \times m_s / a_s' \times m_{ho}$.....(2) where a_{ho} and a_s' are the area of oxygenated product and standard, and m_{ho} and m_s are the moles of oxygenated and brominated product and standard, respectively. The F' = response factor for the oxygenated and brominated products with respect to standard.

Constancy of F' has been checked by varying randomly the moles of alkenols. The constancy of both F and F' having been checked, varying moles of standard randomly without changing the moles of alkenol and oxygenated and brominated product respectively, it can be concluded that equation (1) and (2) should always be valid.

In case of hydrocarbon after reaction is over,

$$A_h' / m_h' = F \times a_s'' / m_s'$$

Therefore, $m_h' = a_h' \times m_s' / a_s'' \times F$.....(3), where a_h' and a_s'' are the area of alkenol and standard respectively. m_h' is the unknown moles of alkenol and m_s' is the moles of standard.

From this equation m_h' can be determined by applying known values of a_h', a_s'' and m_s'.

In the case of oxygenated and brominated product after the reaction is over,

$$a_{ho}'' / m_{ho}'' = F' \times a_s''' / m_s''$$

Therefore, $m_{ho}'' = a_{ho}'' \times m_s'' / a_s''' \times F'$..... (4), where a_{ho}'' and a_s''' are the area of oxygenated product and standard respectively. m_s'' is the moles of standard and m_{ho}'' is the unknown moles of oxygenated and brominated product. Thus, from the equation (4) m_{ho}'' have been calculated, as all other terms are known.

Therefore, % GC yield = [moles of oxygenated and brominated product (m_{ho}'') / {moles of alkenol (m_h') + moles of oxygenated and brominated product (m_{ho}'')}]×100.

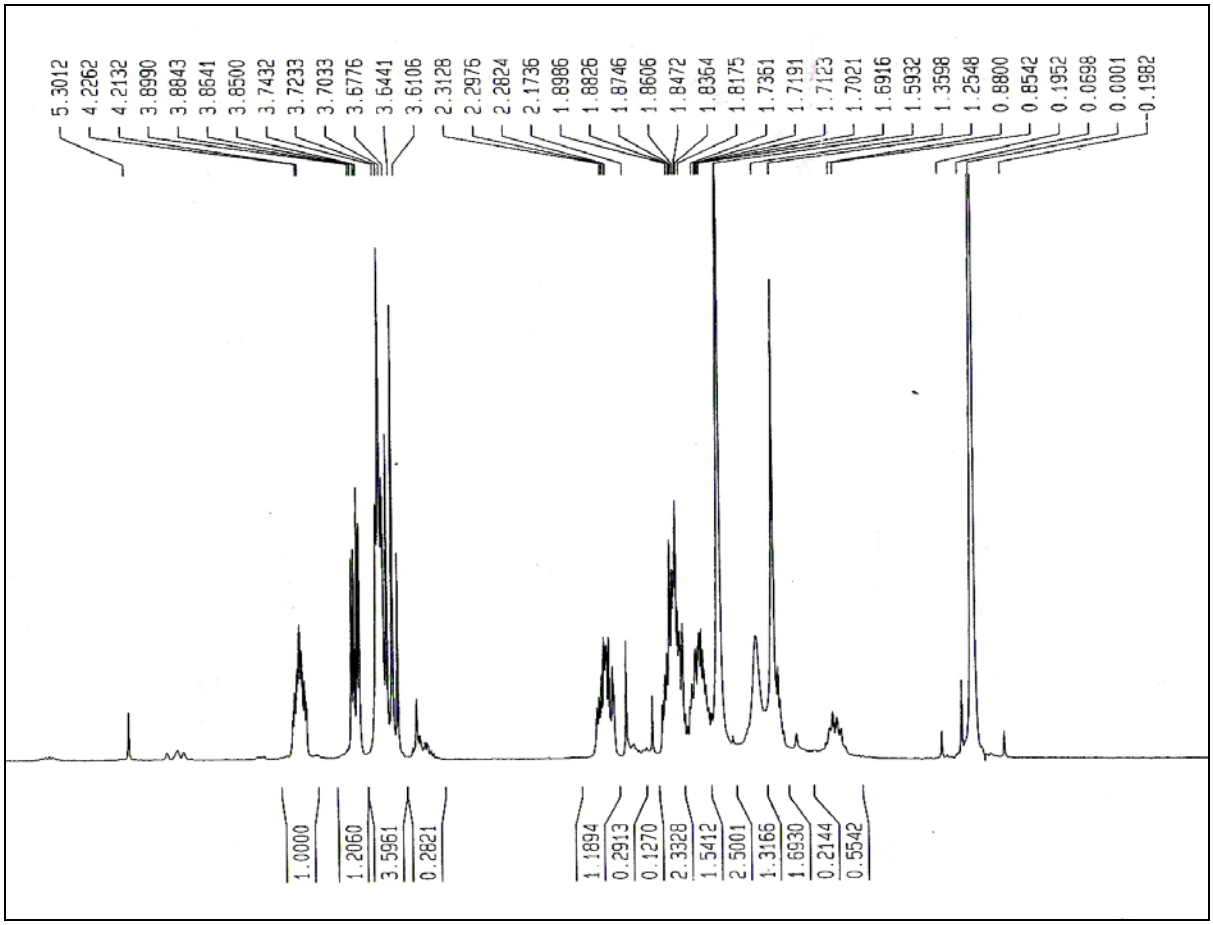

Fig.S7: ^{1}H NMR spectrum of the brominated products of 4-pentene 1-ol.