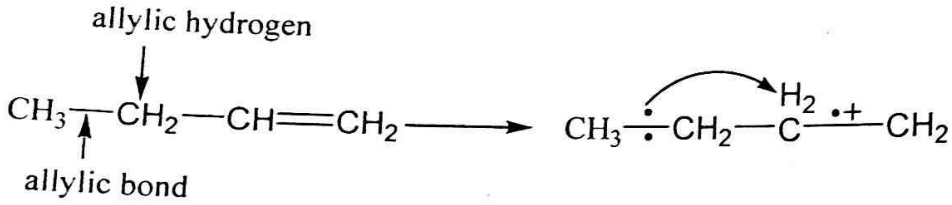
FRAGMENTATION OF ALKENE

Alkenes:

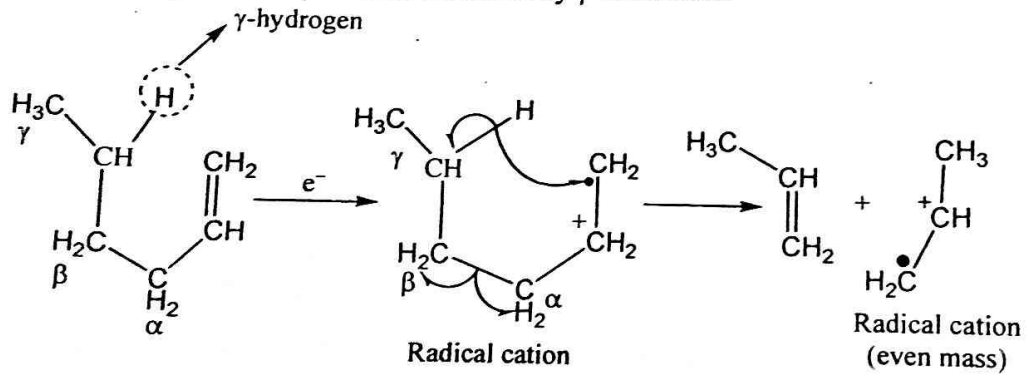
- Alkenes characteristically show a strong molecular ion peak
- They cleave readily to form resonancestabilized allylic cations

1. **Allylic Fission :** $CH_3-CH_2-CH=CH_2]^{\bullet+}$

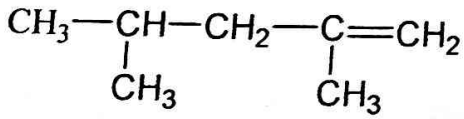
(a) Normal :



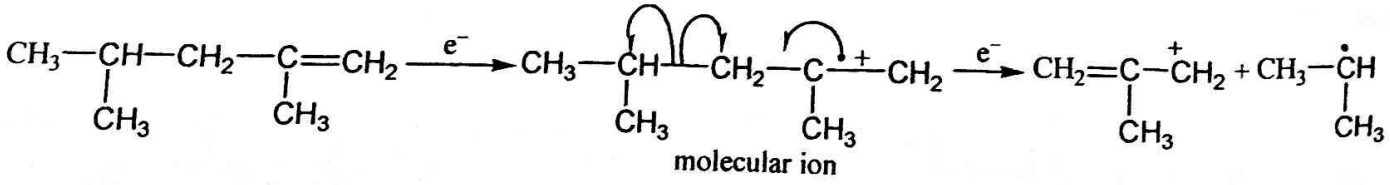
(b) Mclafferty Rearrangement : If γ-H is present in the alkene the MR fragment will be the base peak. the M_C. Laffety rearrangement is β fission followed by γ-H transfer.



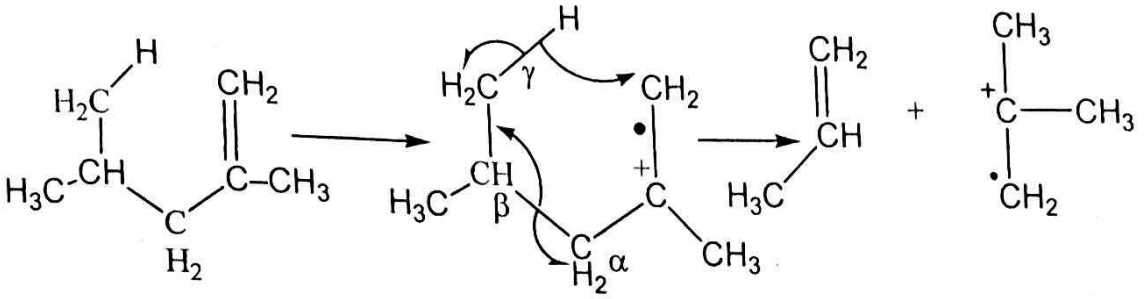
Problem: Give the allylic fission and MR in the given alkene.



2. **Allylic Cleavage :**

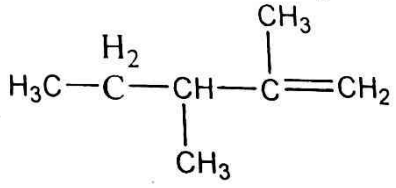


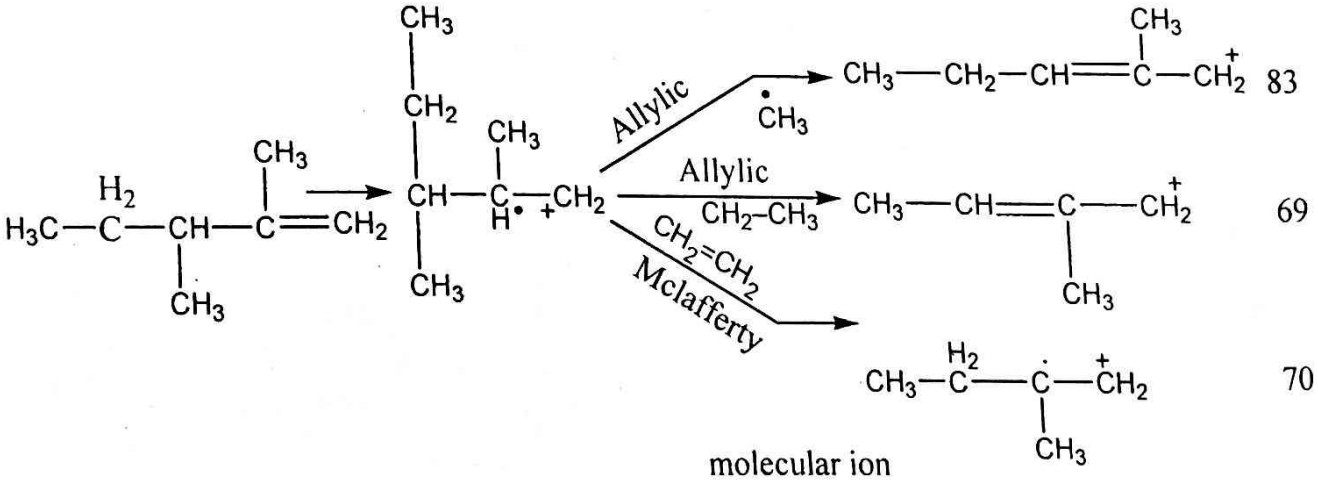
Mclafferty Rearrangement :



EXAMPLES

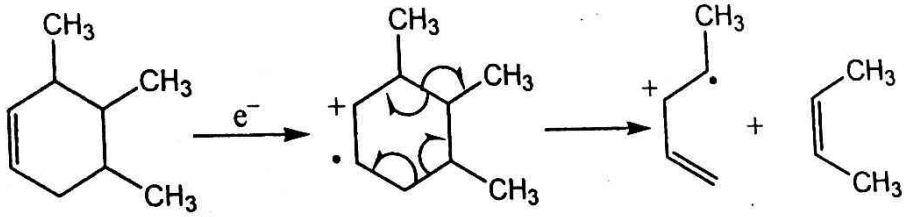
Give the possibilities of mass spectrum in



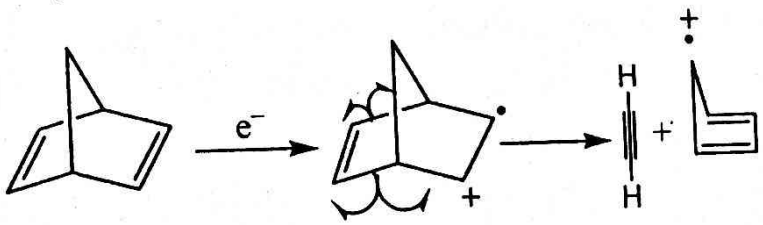


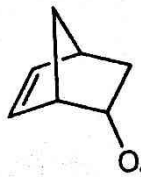
Note: When 2 or more possibility for allylic fission the bulky group preferentially goes as radical.

(c) Cyclohexene and its derivative : This type of Alkene shows fragmentation by Retro-diels alder reactio

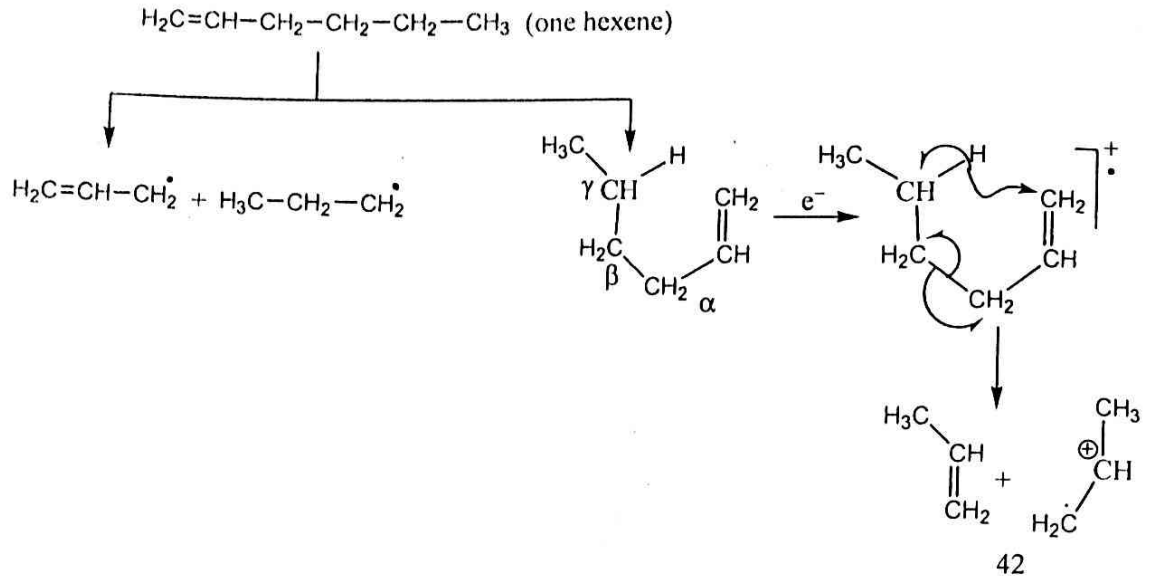


2. Explain the peak, at M/Z 66 and 26. in the ratio 5 : 1 for the mass spectrum of norbarene?

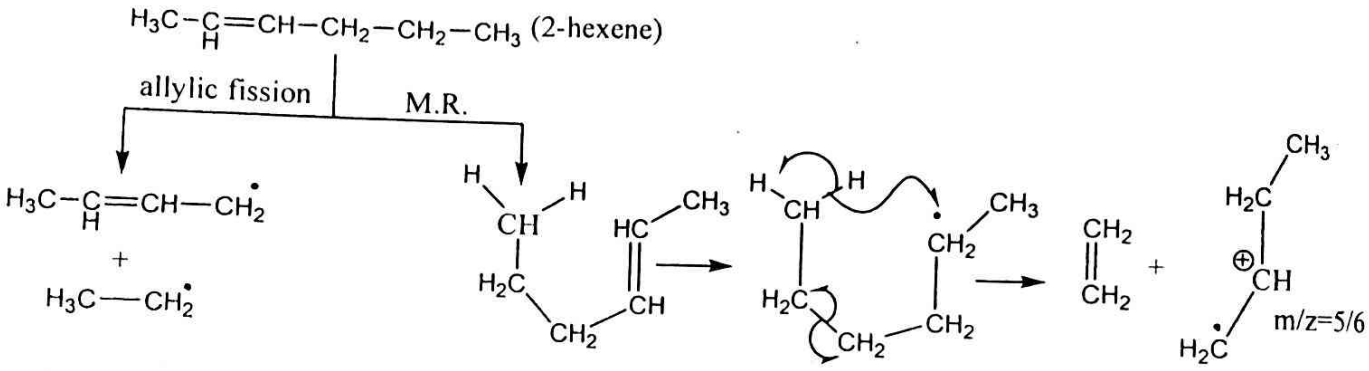


3. The compound  gives m/z 66 in its mass spectrum explain.

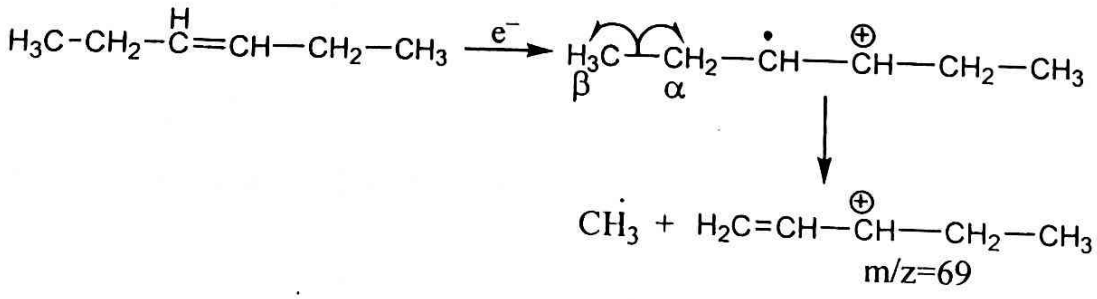
4. How can you differenciate 1-hexene, 2-hexene and 3-hexene on the basis of mass spectrum?



Now,



Now,



3-hexene will not give MR because it has no γ-H atom.