Question #61062 – Chemistry – Organic Chemistry

Questions:

Explain the following:

i) E2 elimination does not give rearranged product.

ii) E1 elimination does not involve isotope effect;

iii) The elimination of HCl from chlorofumaric acid is 50 times faster than from chloromalic acid.

iv) Hofmann elimination gives less substituted alkene

v) E2 is an anti-elemination.

Answers:

i) Typical mechanism for halogen alkanes. Elimination of H and halogen occur in one time, as result carbocation or carboanion is not formed and product of rearrange is not formed also.

ii) Carbocation is formed in time of E1 reaction, and stage of formation of cation limitates rate of reaction. Bond C-Hal breakes in this time, and another orbitals like C-D near does not influence this process, as result E1 elimination does not involve isotope effect.

iii) Result of termodinamic effect. Fumaric acid is more stable than malic acid, as result it is formed more easy.

iv) Mechanism of Hofmann elimination - E1CB – in time of reaction carboanion is formed. Primary carboanion is more stable than secondary as result - Hofmann elimination gives less substituted alkene