

STEREOCHEMISTRY

1.

23-07-2020

Lecture -4

Deg-II (H)

Geometrical Isomerism Continued...

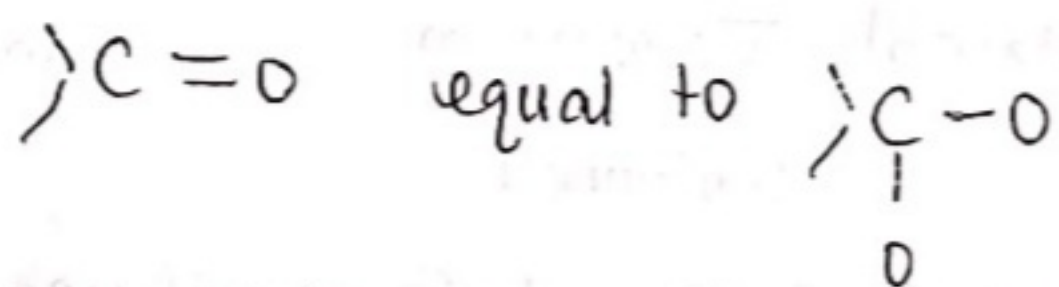
The following procedure is followed in specifying the configuration of such compounds.

1. Assign the priority order to the two groups attached to each of the doubly bonded carbon in accordance with the sequence rules.

Sequence rules for determining the priority order to atoms or groups attached to doubly bonded carbon atoms.

- (a) Higher priority is assigned to atoms directly attached to the carbon atoms of higher atomic number.
- (b) If isotopes of same element are attached, the isotope with higher mass number will have a higher priority. If the priority cannot be decided by this rule, it is then determined by comparing the next atoms in the group, and so on.
- (c) A doubly or triply bonded atom is considered equivalent to two or three such atoms.

Thus a carbonyl group is considered as if carbon had two single bonds to oxygen, i.e;



By application of these rules, some common substituents are given the following priority sequence.

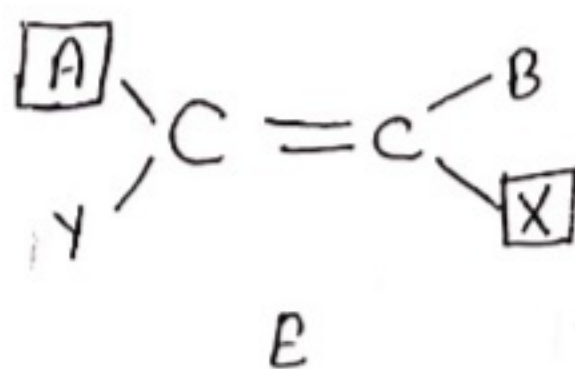
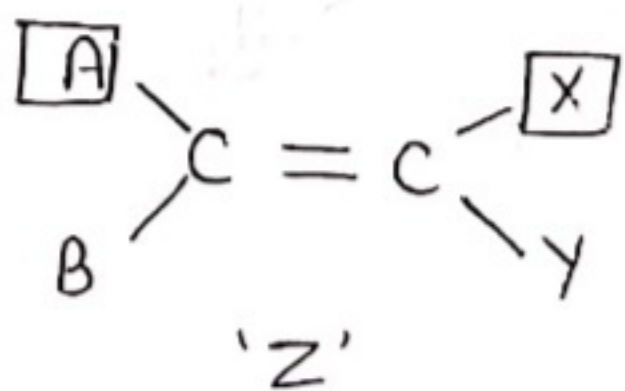
I, Br, Cl, SO₃H, SH, F, OCOR, OR, OH, NO₂, NR₂, NHR, NH₂, COOR, COOH, COR, CHO, CH₂OH, CN, C₆H₅, CR₃, CHR₂, CH₂R, CH₃, D, H

② Select the atom/group with higher priority on each doubly bonded carbon.

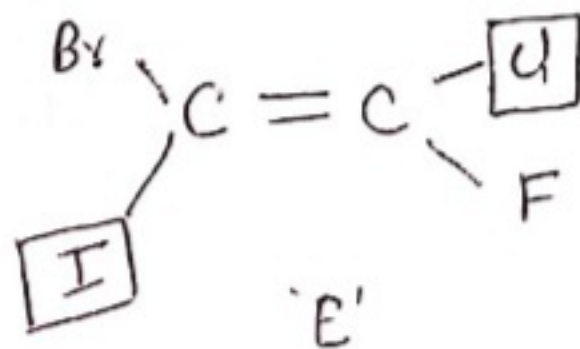
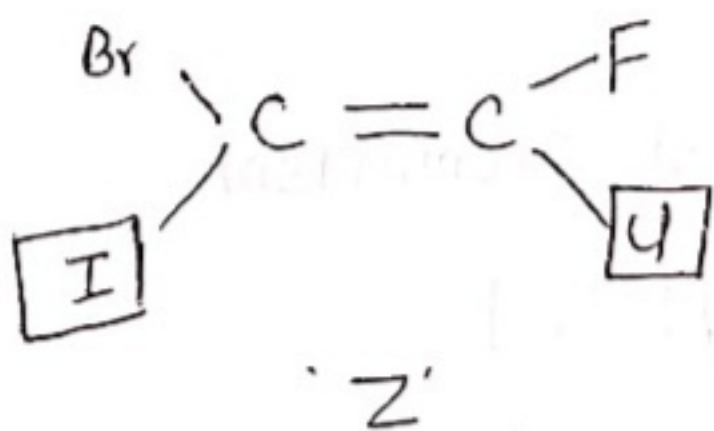
If the atoms/groups of higher priority on each carbon are on the same side of the double bond, the isomer is assigned the configuration 'Z' (from German word Zusammen meaning together).

On the other hand, if the atoms/groups of higher priority on each carbon are on the opposite sides of the double bond, the isomer is assigned the configuration 'E' (from the German word entgegen meaning against).

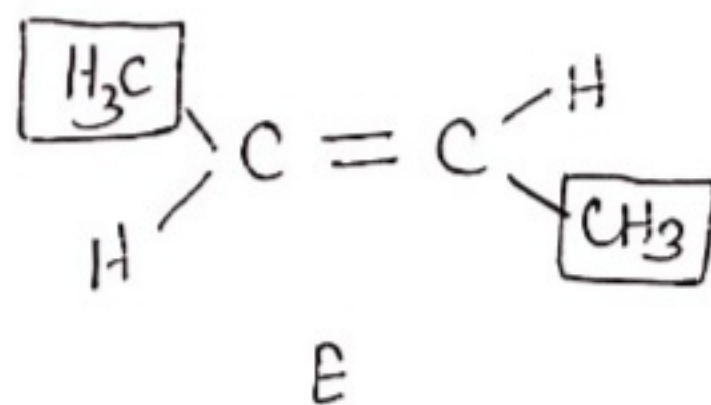
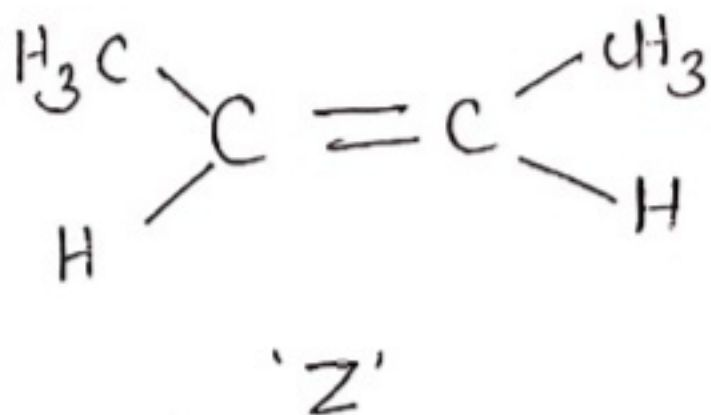
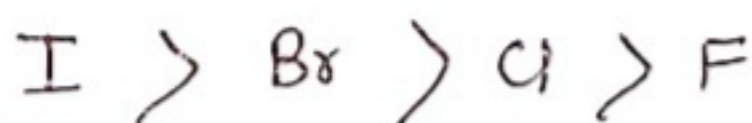
If A and X are of higher priority



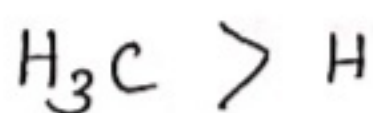
* Now let us consider the following example.

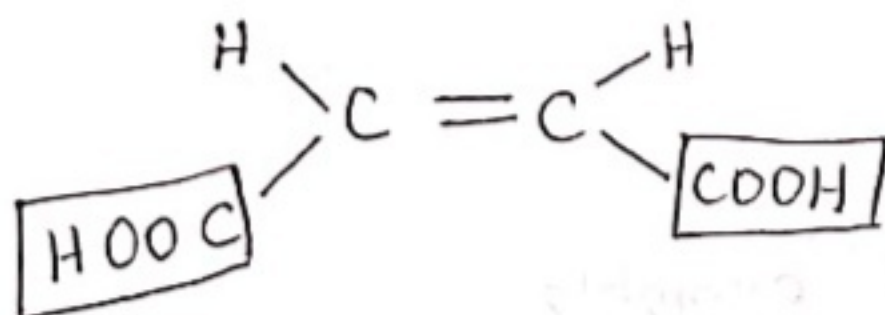
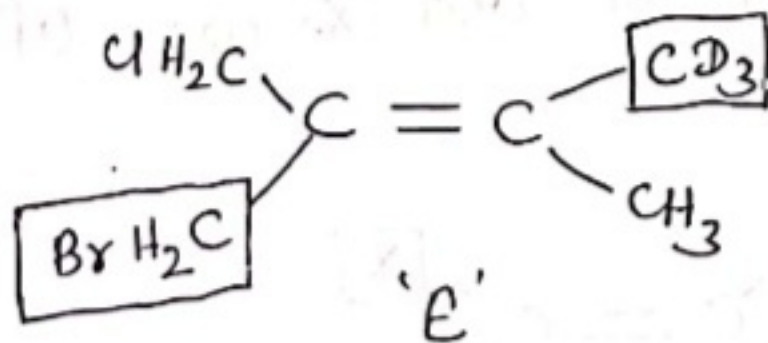
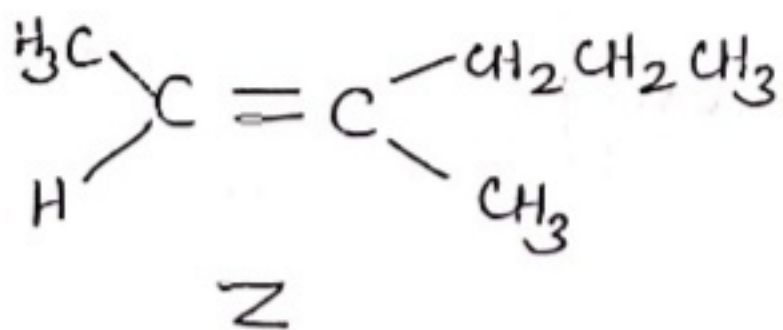


Priority order

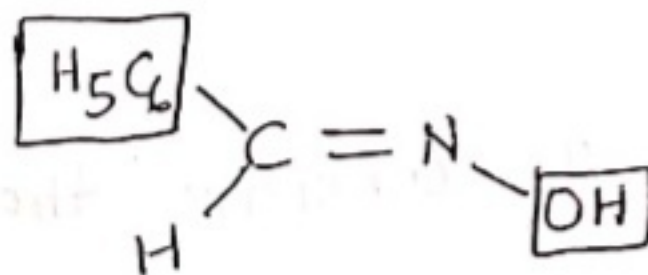


Priority order





'Z' isomer



Geometrical Isomerism Completed.

By-Dr.Rinky
Dept.of Chemistry.
J.N.College, Madhubani.