

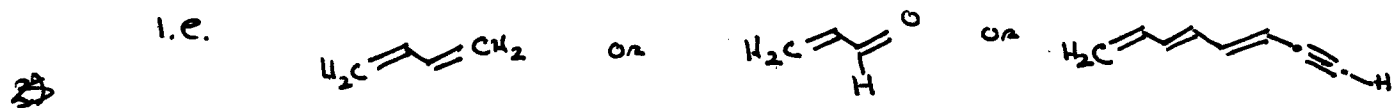
MORE ON RESONANCE FORMS

MAJOR POINTS

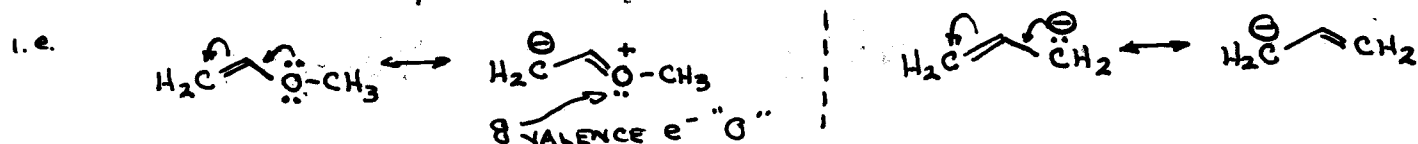
- 1) IT INVOLVES THE π SYSTEM (MEANING p ORBITALS)
- 2) ANY TIME YOU CAN PUT A NEGATIVE ⁽⁻⁾ CHARGE ON AN ELECTRONEGATIVE ATOM, THE RESONANCE FORM IS ESPECIALLY 'GOOD' (CONTRIBUTES TO A LARGE DEGREE TO OVERALL PICTURE OF BONDING, AND RESULTS IN CONSIDERABLE STABILIZATION)
- 3) IF YOU PUT A POSITIVE ⁽⁺⁾ CHARGE ON AN ELECTRONEGATIVE ATOM, IT IS
 - a) O.K. IF THE ELECTRONEGATIVE ATOM HAS 8 VALENCE ELECTRONS
 - b) NOT O.K. IF THE ELECTRONEGATIVE ATOM HAS 6 VALENCE ELECTRONS

SO, THERE ARE 4 CLASSES OF SITUATIONS WHERE RESONANCE STRUCTURES ARE NORMALLY DRAWN:

- 1) IF YOU HAVE TWO DOUBLE BONDS (OR TRIPLE BONDS) SEPARATED BY A (ONE) SINGLE BOND (ONE, NOT TWO). THIS IS REGARDLESS OF WHETHER THIS IS A C=C, A C=O, OR A C=N



- 2) YOU HAVE AN ATOM WITH A LONE PAIR ADJACENT TO A DOUBLE (OR TRIPLE BOND), AS IN =C-X: . THIS 'X' CAN BE A HETEROATOM (O, N, HALOGEN, S, P) OR A CARBANION (C^-). THIS LONE PAIR IS WRITTEN IN A p ORBITAL SO THAT IT OVERLAPS PROPERLY WITH THE DOUBLE (OR TRIPLE) BOND'S p ORBITALS

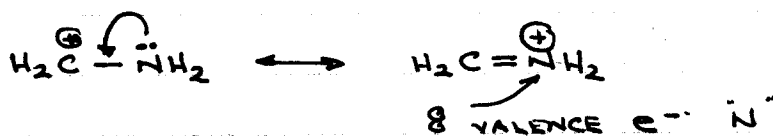


3) IF YOU HAVE A COMPLETELY EMPTY p ORBITAL NEXT TO A DOUBLE (OR TRIPLE BOND). THIS EMPTY p ORBITAL ALMOST ALWAYS IS 'ON' A CARBOCATION C^+ ; IT COULD BE SOMETHING LIKE A B ATOM (BORON).

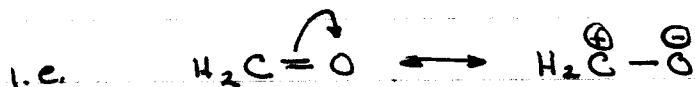


4) IF YOU HAVE AN EMPTY p ORBITAL (AGAIN NORMALLY A CARBOCATION) NEXT TO AN ATOM WITH A LONE PAIR.

i.e.



OK, I'LL ADD A 5th - IF YOU HAVE A DOUBLE OR TRIPLE BOND BETWEEN ATOMS OF DIFFERENT ELECTRONEGATIVITY, YOU CAN DRAW A RESONANCE FORM 'BREAKING' A π BOND, AND FORMALLY LOCALIZING THE - CHARGE ON THE ELECTRONEGATIVE ATOM, AND THE + CHARGE ON THE LESS ELECTRONEGATIVE ONE.



- YOU COULD IN PRINCIPLE DO THIS WITH A $C=C$, BUT IT IS CONSIDERED TRIVIAL NORMALLY.