The Curved Arrow Convention

- 1. Curved arrows show the movement (flow) of electron during bond breaking and/or bond making processes. The foot of the arrow indicates where the electron or electron pair originates, the head of the arrow shows where the electron or electron pair ends up.
 - A. The movement of a <u>single electron</u> is denoted by a curved <u>single</u> headed arrow (fishhook or hook).
 - B. The movement of an <u>electron pair</u> is denoted by a curved <u>double</u> headed arrow.
- 2. If an electron pair moves in on a new atom, another electron pair must leave so that the atom does not exceed a full valance of eight electrons. There are two common exceptions:
 - A. When an atom already has an incomplete valance (R_3C^+) .
 - B. With second row (or below) elements the octet rule may be violated.
- 3. The arrows completely dictate the Lewis structure of the product.

Other Suggestions for Proper Arrow Pushing:

- 4. The natural polarization of double bonds between unlike atoms is in the direction of the more electronegative atom and this will be the important direction of electron movement.
- 5. In drawing a mechanism, the formal charges of atoms in the reactants may change in the product. Use your knowledge of Lewis structures and formal charge to determine this.
- 6. The first step in writing a mechanism is to identify the <u>nucleophile</u> (Lewis Base) and the <u>electrophile</u> (Lewis Acid). The first arrow is always from the nucleophile to the electrophile.