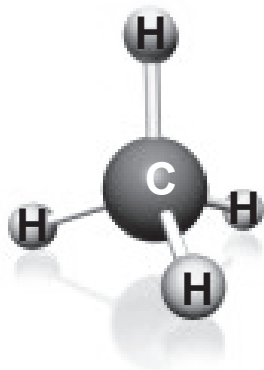
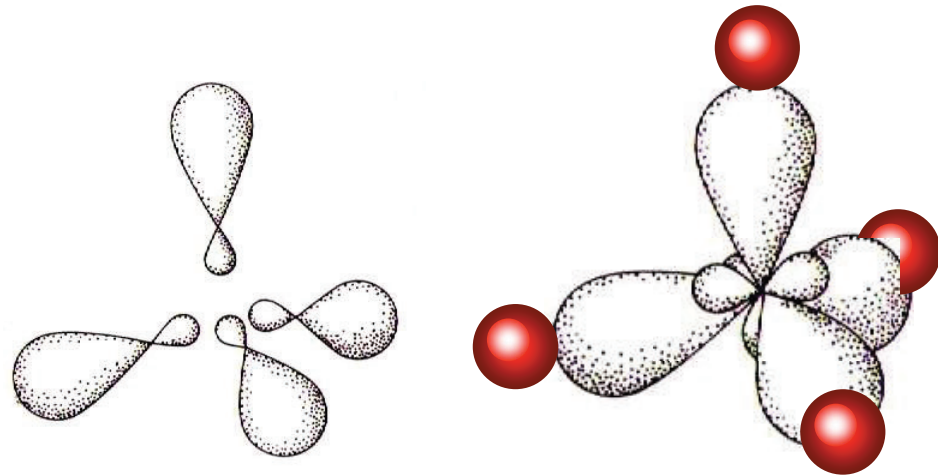
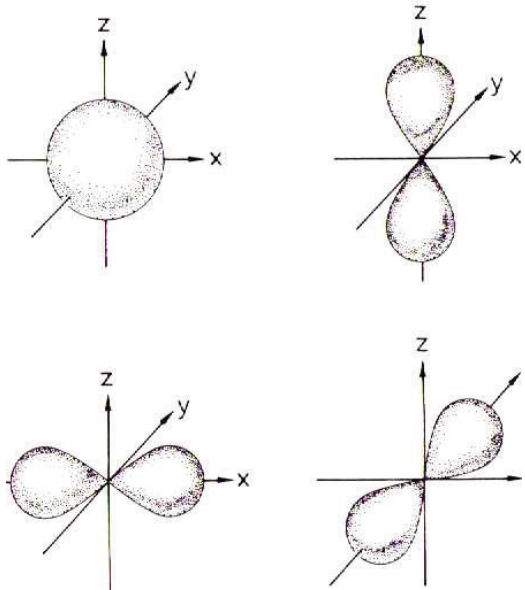


LCAO-Methode und Hybridisierung am Beispiel Methan



sp³-Hybrid-Orbitale für C-Atom + Wasserstoff

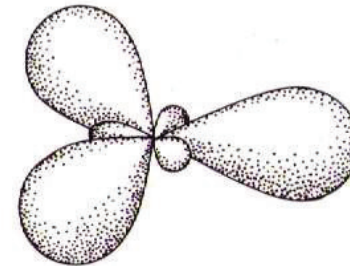
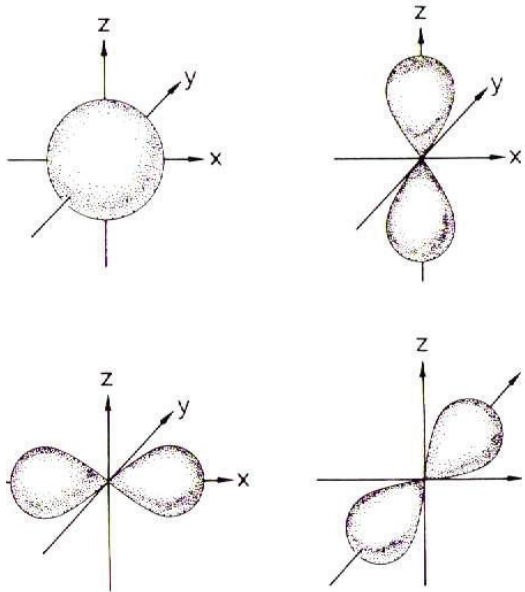
$$\psi_1 = \frac{1}{2}(\psi_s + \psi_{p_x} + \psi_{p_y} + \psi_{p_z}) + \Psi_{1s,H1}$$

$$\psi_2 = \frac{1}{2}(\psi_s + \psi_{p_x} - \psi_{p_y} - \psi_{p_z}) + \Psi_{1s,H2}$$

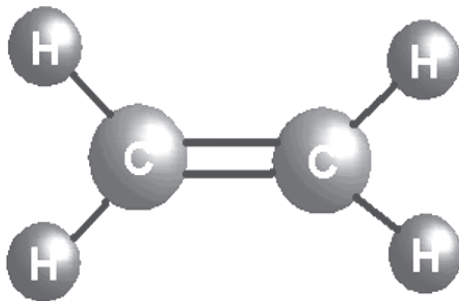
$$\psi_3 = \frac{1}{2}(\psi_s - \psi_{p_x} + \psi_{p_y} - \psi_{p_z}) + \Psi_{1s,H3}$$

$$\psi_4 = \frac{1}{2}(\psi_s - \psi_{p_x} - \psi_{p_y} + \psi_{p_z}) + \Psi_{1s,H4}$$

LCAO-Methode und Hybridisierung am Beispiel Ethen



sp²-Hybrid-Orbitale für C-Atom

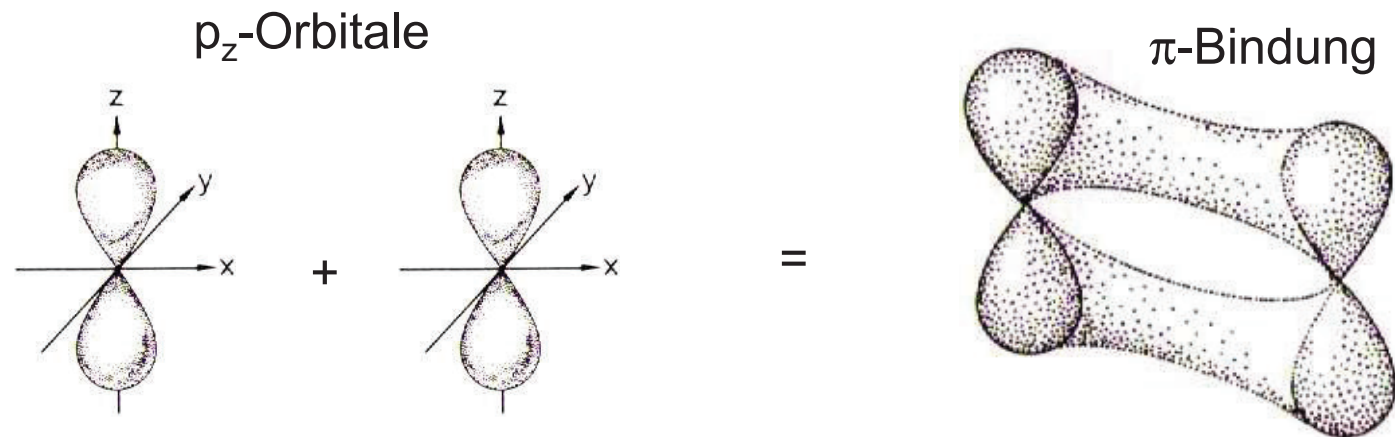
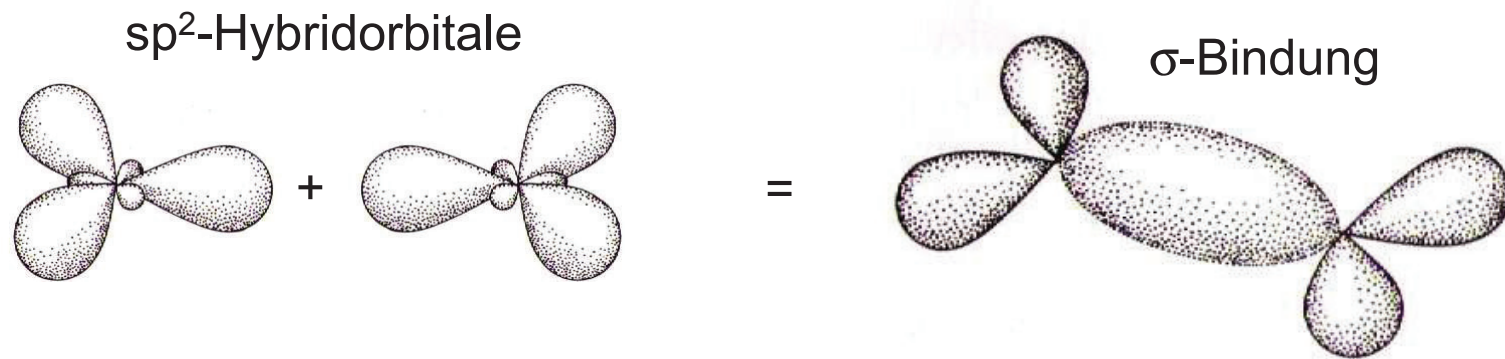


$$\psi_1 = \sqrt{\frac{1}{3}} \left(\psi_s + \sqrt{2} \psi_{p_x} \right)$$

$$\psi_2 = \sqrt{\frac{1}{3}} \left(\psi_s + \sqrt{\frac{3}{2}} \psi_{p_y} - \sqrt{\frac{1}{2}} \psi_{p_x} \right)$$

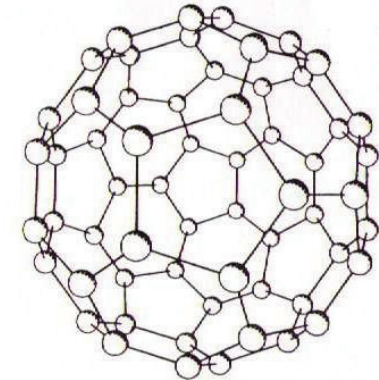
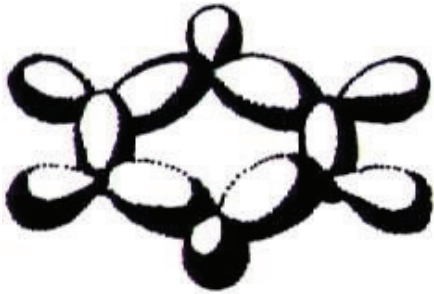
$$\psi_3 = \sqrt{\frac{1}{3}} \left(\psi_s - \sqrt{\frac{3}{2}} \psi_{p_y} - \sqrt{\frac{1}{2}} \psi_{p_x} \right)$$

LCAO-Methode und Hybridisierung am Beispiel Ethen



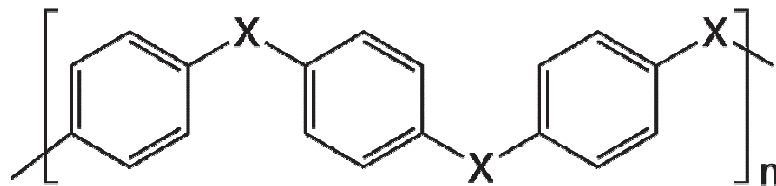
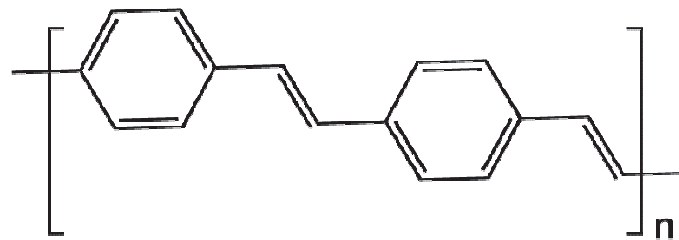
σ - und π -Bindungen: von C_6H_6 zu komplizierten Molekülen

Benzol

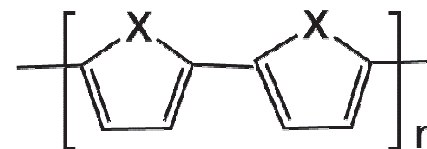


C_{60} (Buckminster-Fulleren)

Polymere



(X = NH/N, S)



(X = NH, S)