

**Fig. 9-8, p. 414**

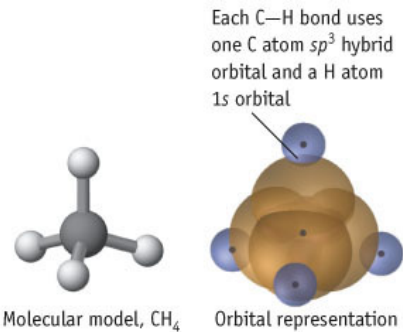
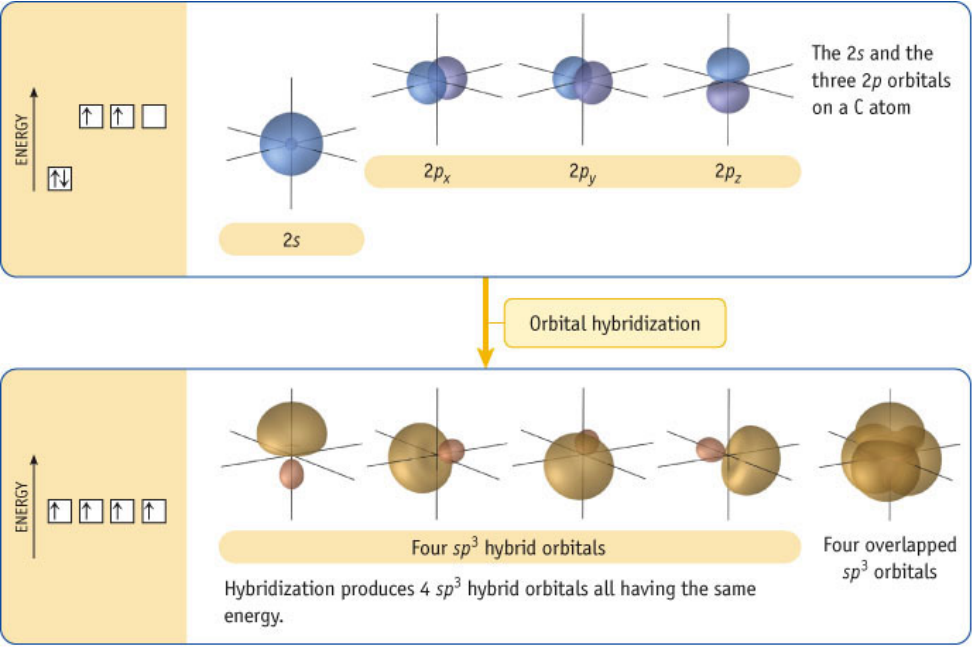
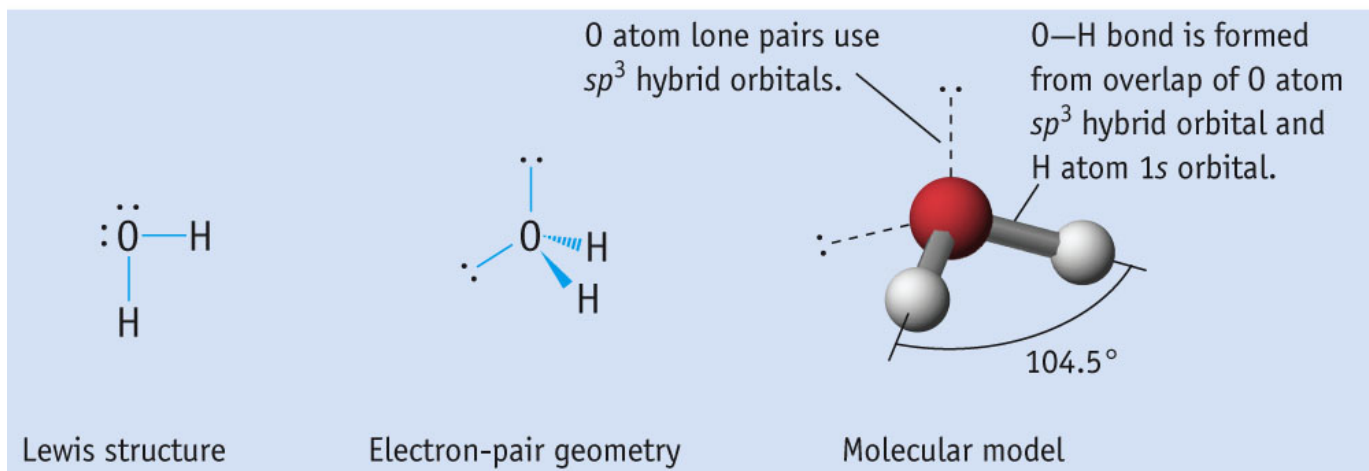
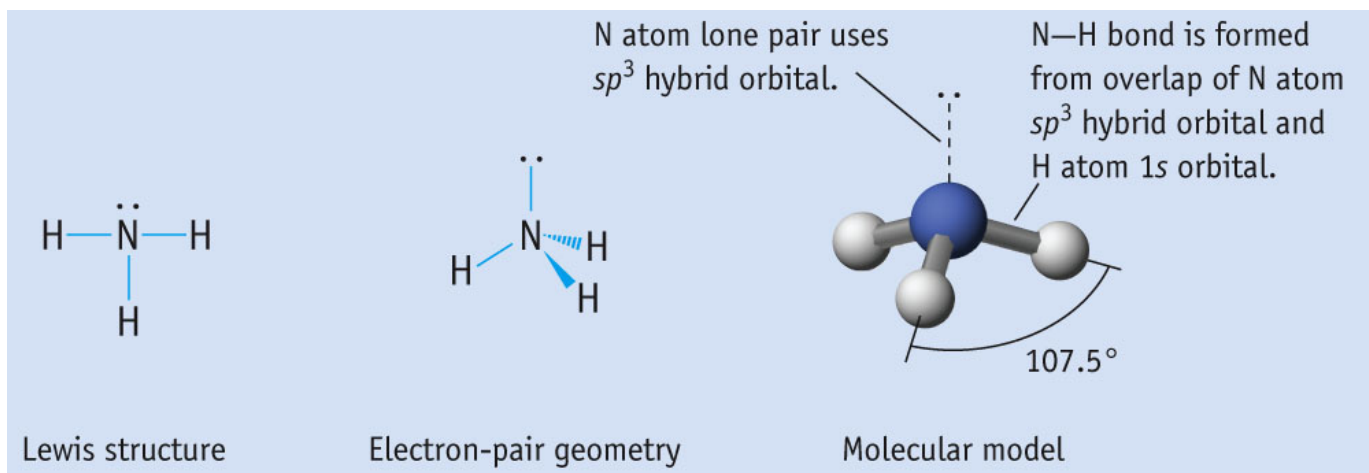





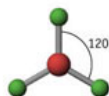





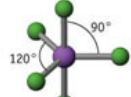
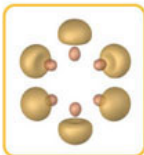

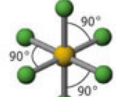


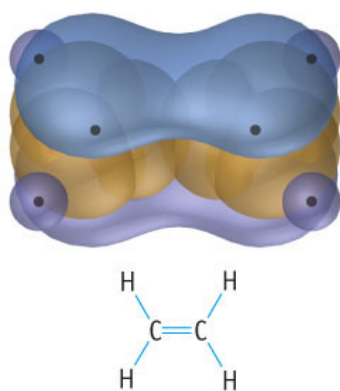
Fig. 9-6, p. 411



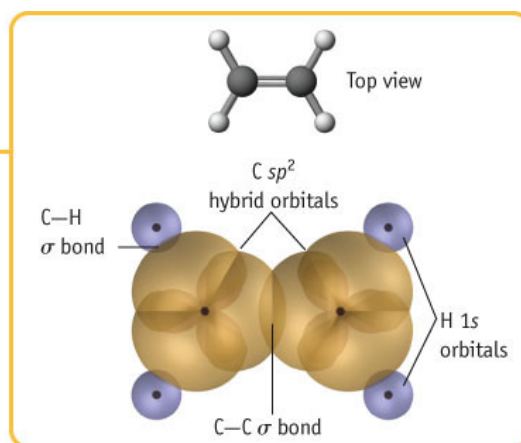
Arrangement of Hybrid Orbitals	Geometry	Example
<p>Two electron pairs <math>sp</math></p> 	 <p>Linear</p>	 <p><math>180^\circ</math> <math>\text{BeCl}_2</math></p>
<p>Three electron pairs <math>sp^2</math></p> 	 <p>Trigonal-planar</p>	 <p><math>120^\circ</math> <math>\text{BF}_3</math></p>
<p>Four electron pairs <math>sp^3</math></p> 	 <p>Tetrahedral</p>	 <p><math>109.5^\circ</math> <math>\text{CH}_4</math></p>
<p>Five electron pairs <math>sp^3d</math></p> 	 <p>Trigonal-bipyramidal</p>	 <p><math>90^\circ</math> <math>120^\circ</math> <math>\text{PF}_5</math></p>
<p>Six electron pairs <math>sp^3d^2</math></p> 	 <p>Octahedral</p>	 <p><math>90^\circ</math> <math>90^\circ</math> <math>90^\circ</math> <math>\text{SF}_6</math></p>

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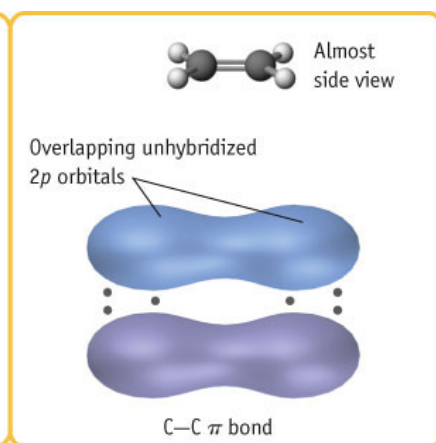
Fig. 9-5, p. 410



**(a)** Lewis structure and bonding of ethylene,  $\text{C}_2\text{H}_4$ .



**(b)** The C—H  $\sigma$  bonds are formed by overlap of C atom  $sp^2$  hybrid orbitals with H atom  $1s$  orbitals. The  $\sigma$  bond between C atoms arises from overlap of  $sp^2$  orbitals.



**(c)** The carbon-carbon  $\pi$  bond is formed by overlap of an unhybridized  $2p$  orbital on each atom. Note the lack of electron density along the C—C bond axis from this bond.



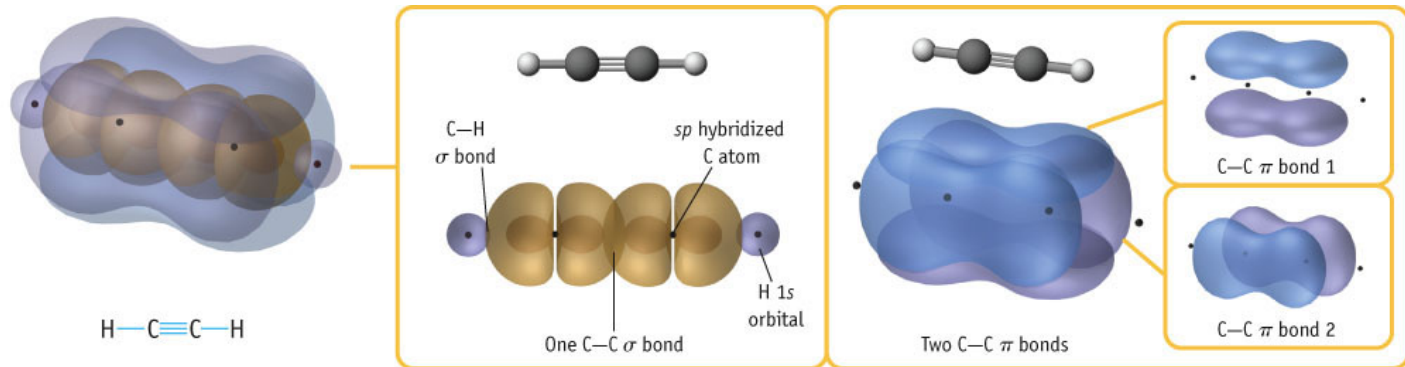
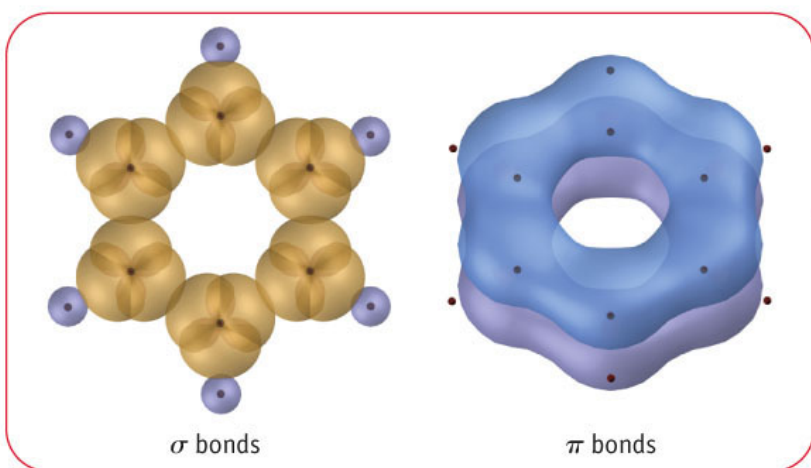
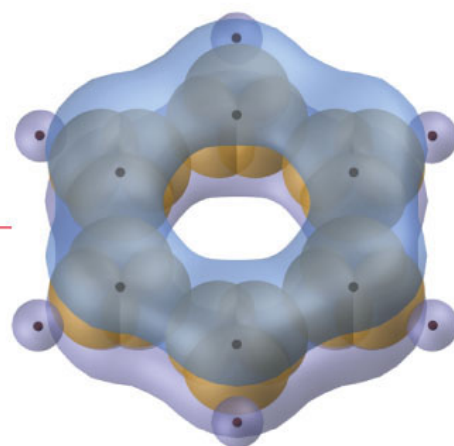


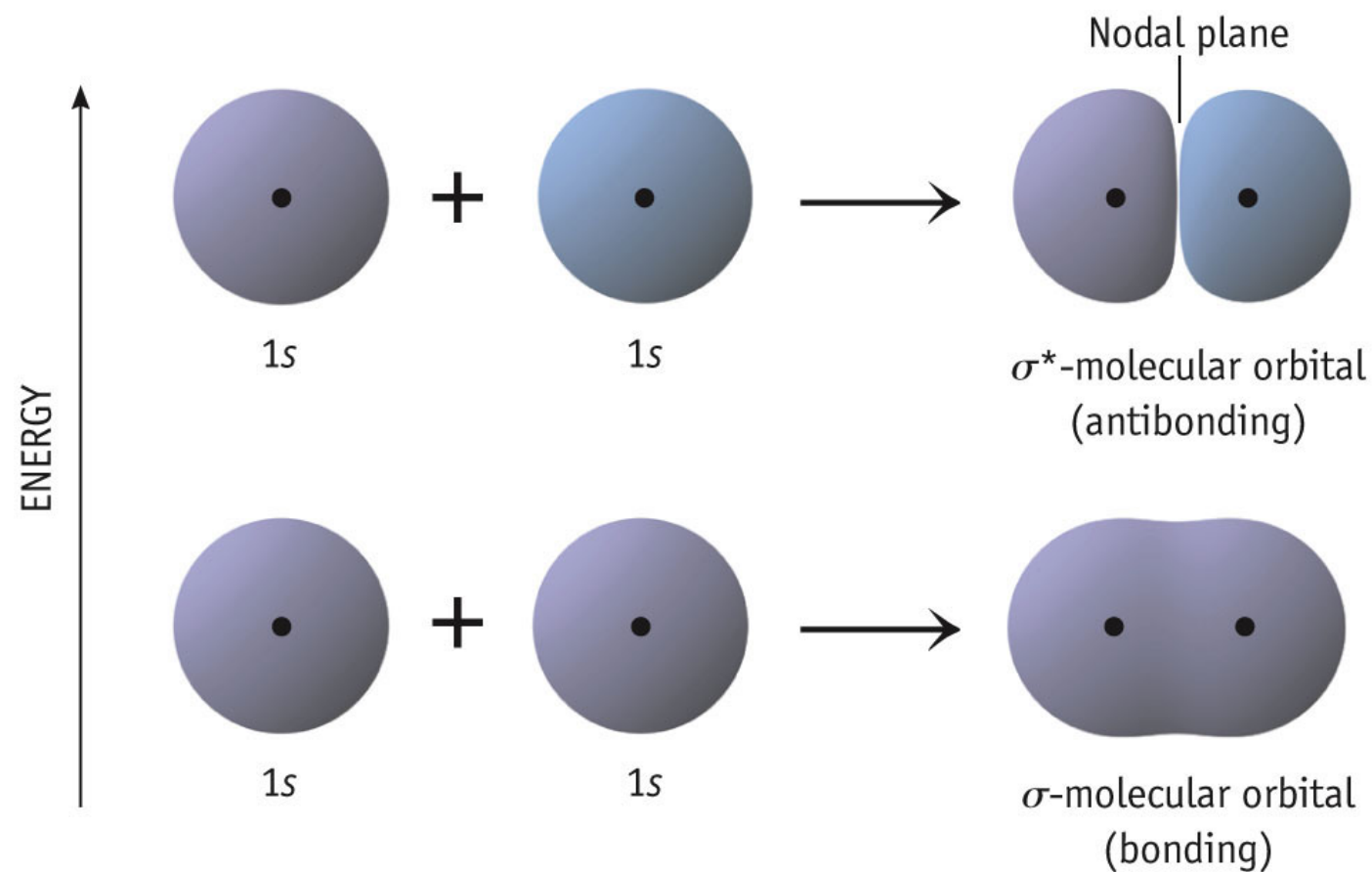
Fig. 9-12, p. 419

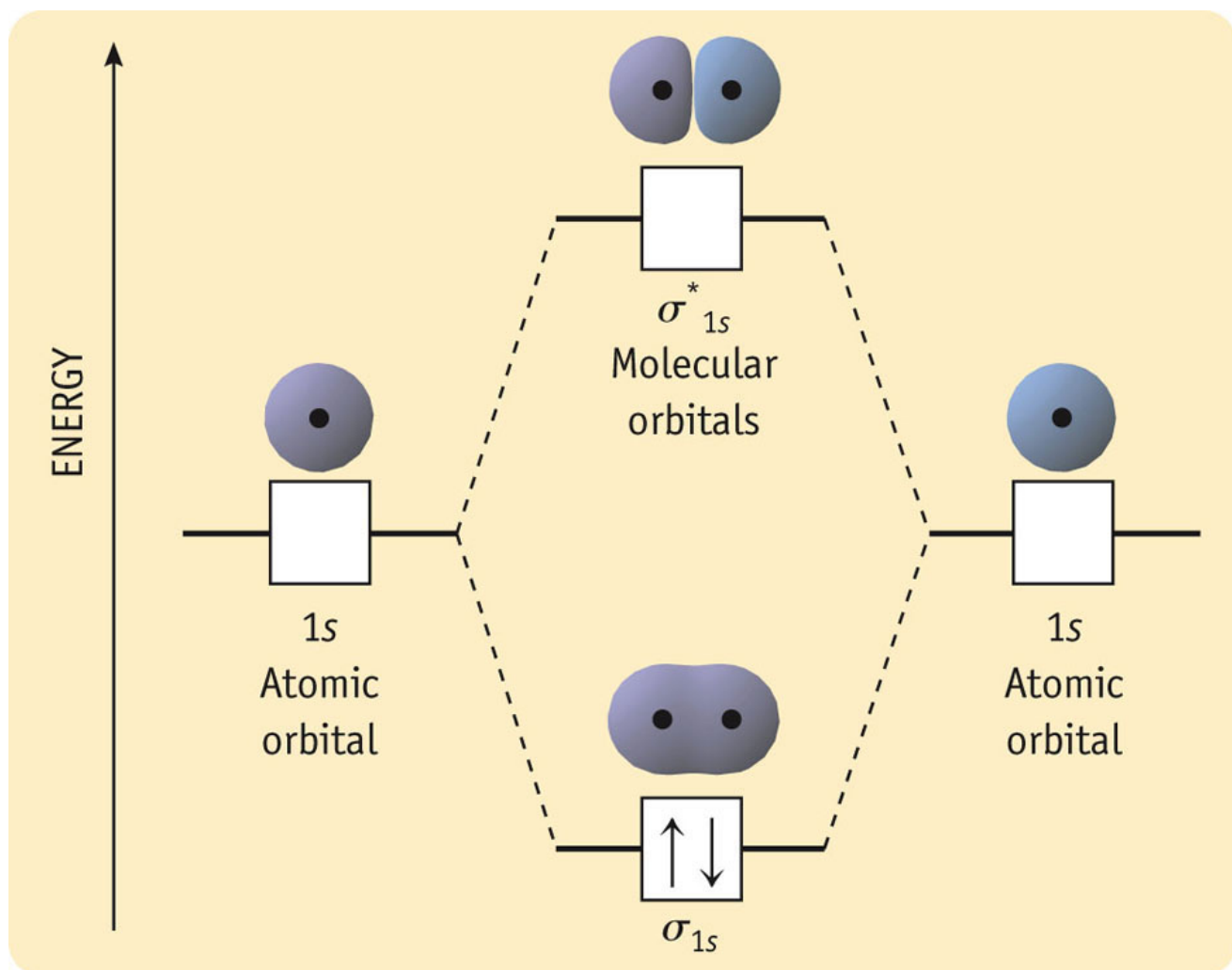


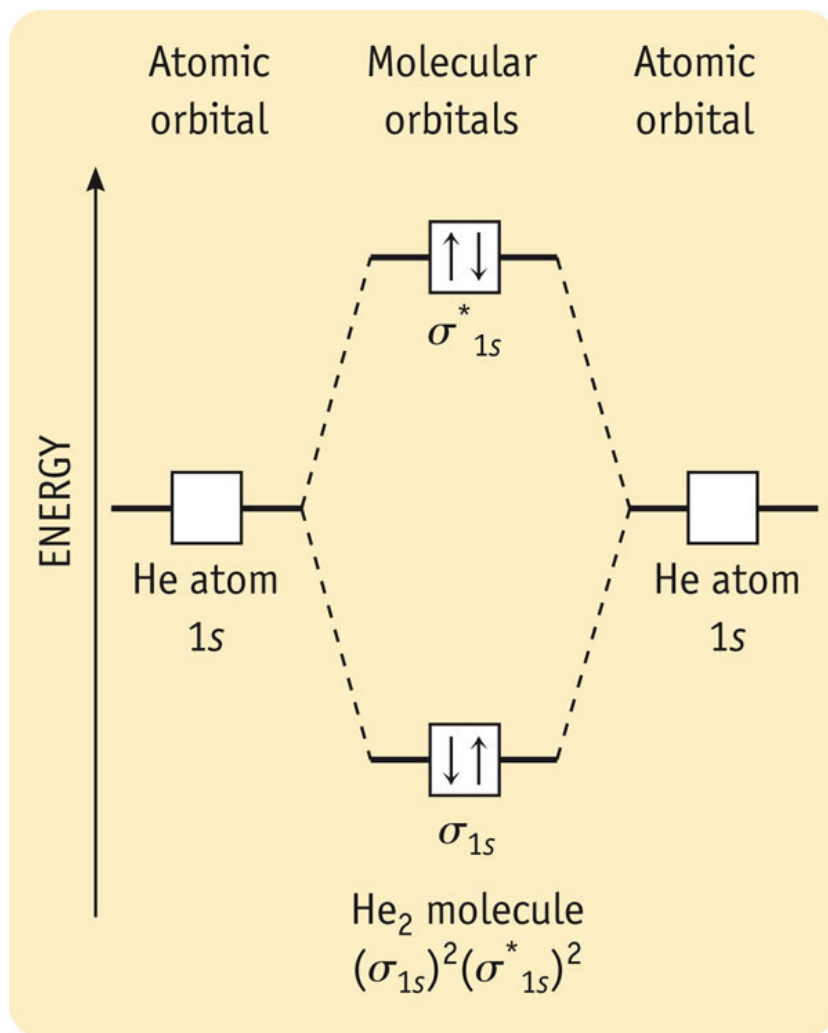
$\sigma$  and  $\pi$  bonding in benzene



Model of bonding in benzene

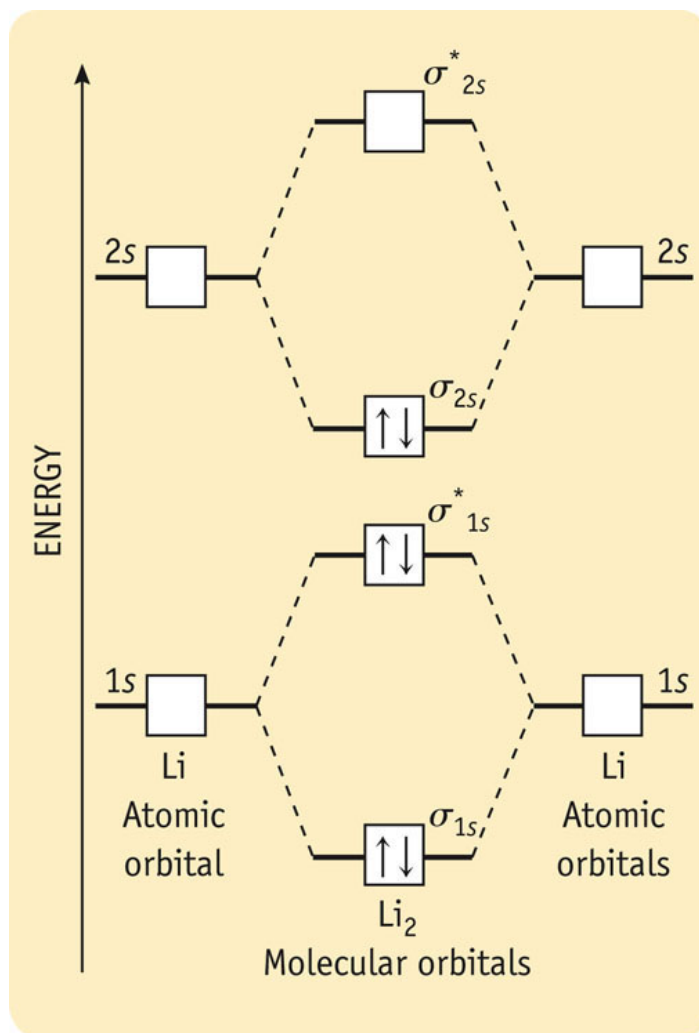






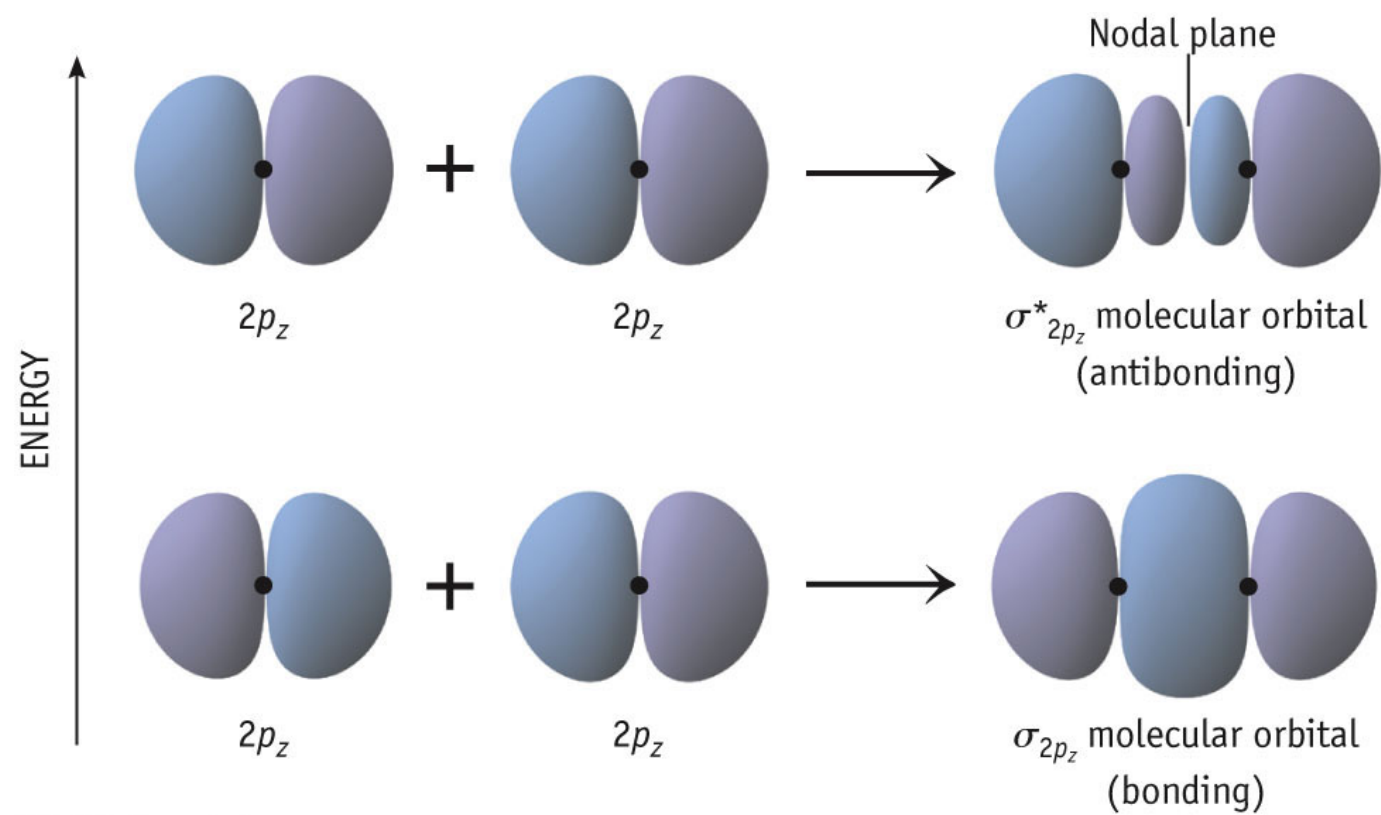
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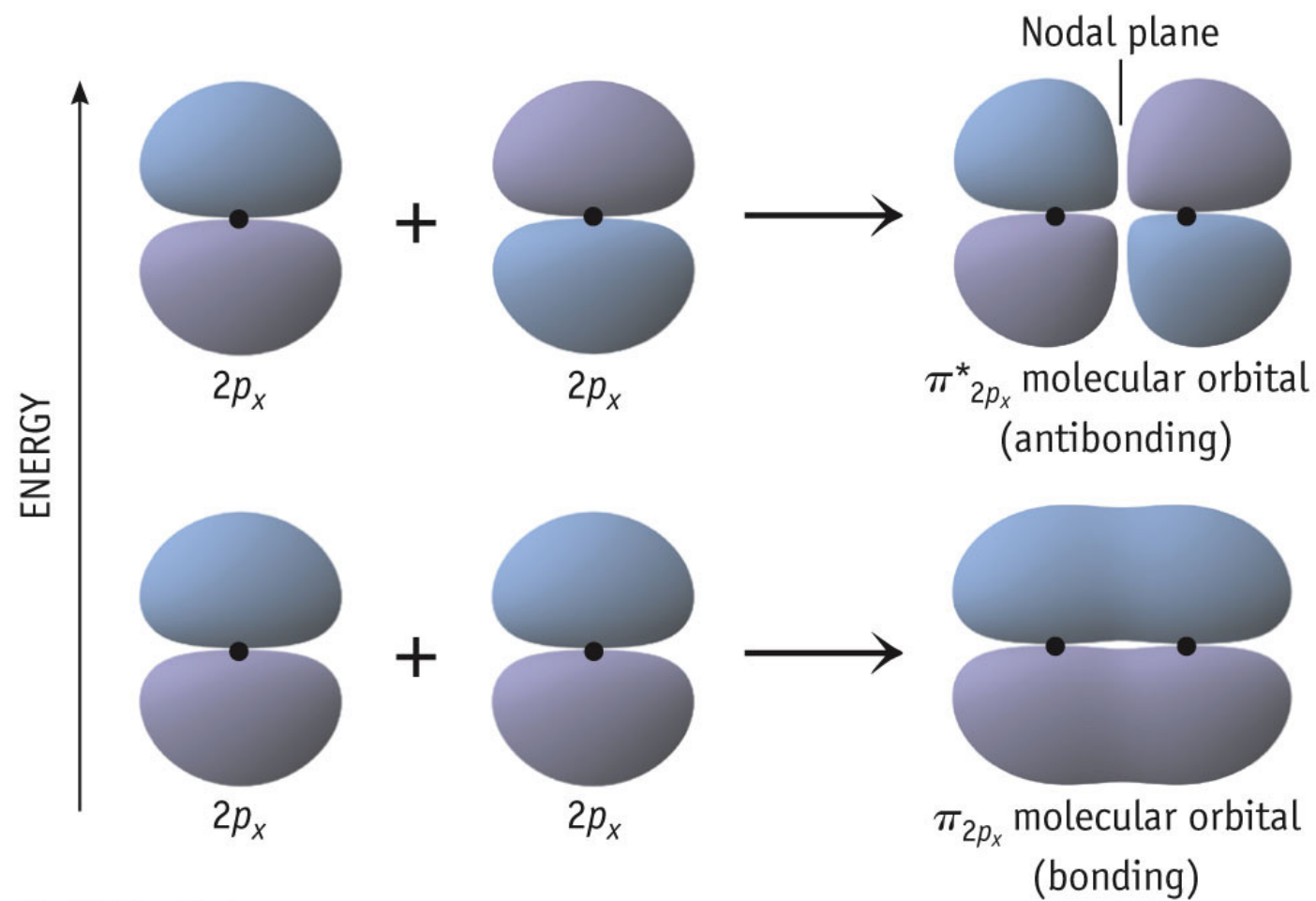
Fig. 9-17, p. 424



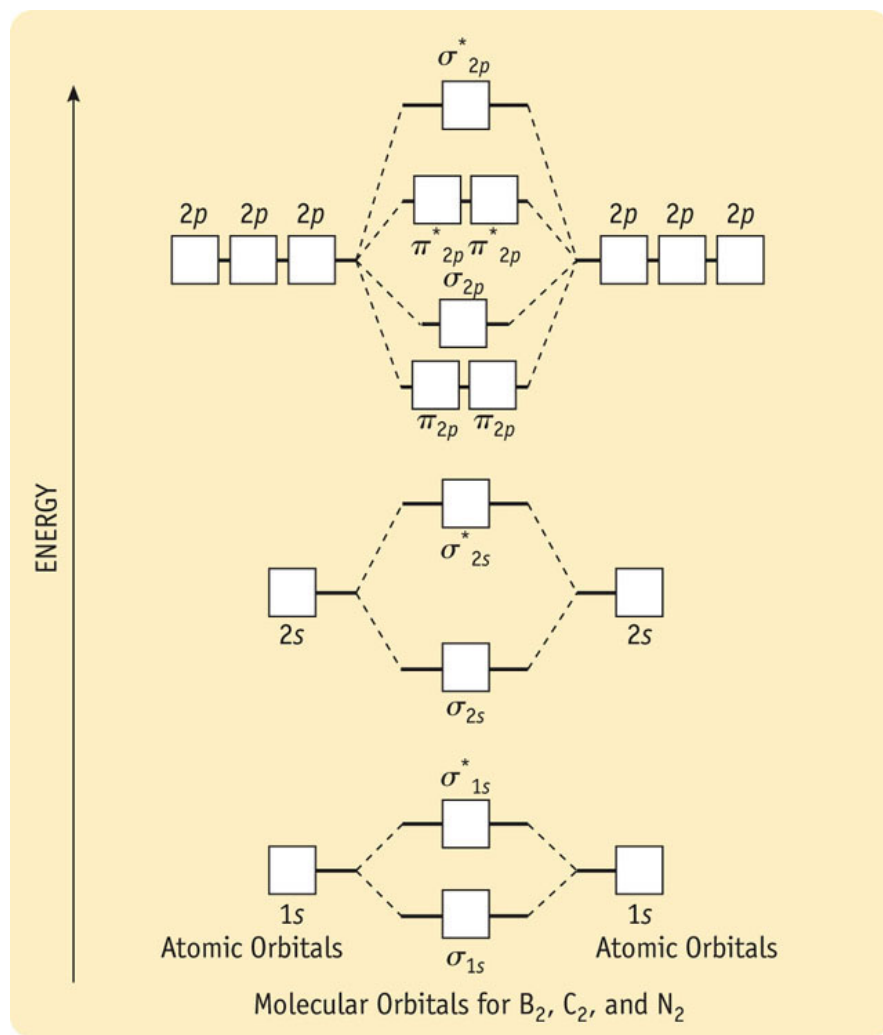
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Fig. 9-18, p. 425









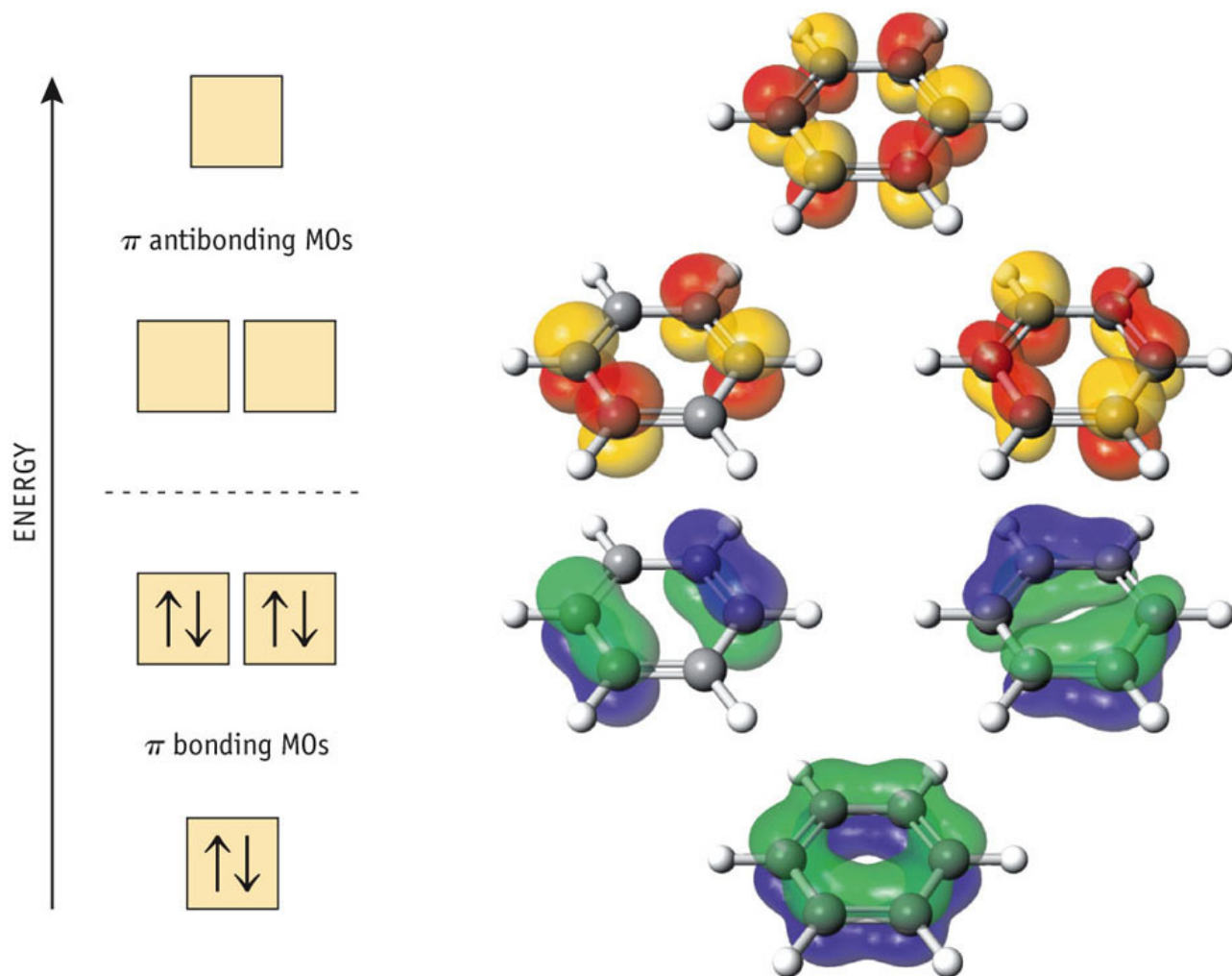


Fig. 9-24, p. 432