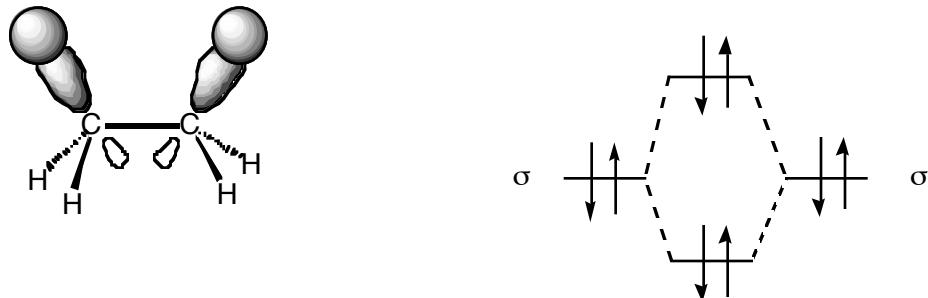


Answers to Problem 16, Chemistry 301X, 2006

(a, b, c See answers to Problem 15)

(d) Interaction between two filled orbitals is destabilizing, and this interaction exists only in the eclipsed form.



(e) Interactions between filled and empty orbitals are stabilizing - this statement is just another way of saying that Lewis acids and Lewis bases react. So, let's look at the interaction between a filled C—H bond and the empty orbital ( $\sigma^*$ ) of the other C—H bond. As shown below, this interaction is stabilizing, and it only exists in the staggered form.

