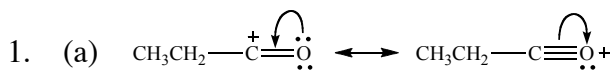


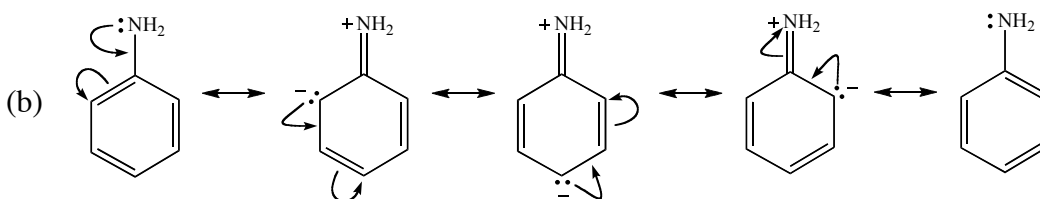
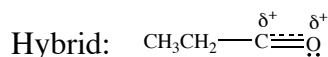
## OWLS: Resonance Solutions

Frequently asked question: My resonance hybrid doesn't look the same as the key. Is it wrong?

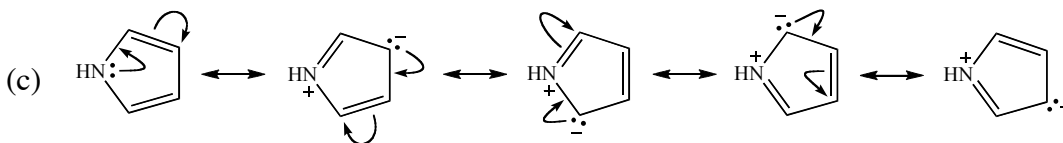
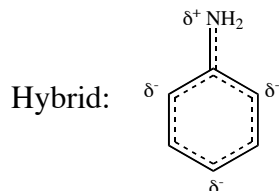
Answer: Remember that less “stable” resonance contributors are poorer representations of the actual molecular structure. In other words, more significant resonance contributors are more important contributors to the hybrid. You may have included the structural features of unimportant contributors in your hybrid, resulting (for example) in a  $\delta^+$  charge when in fact the  $\delta^+$  charge on that atom would be small. The  $\delta^+$  on the carbon atom of a carbonyl group is a very good example. A resonance contributor featuring a formal positive charge on a carbonyl carbon is usually unimportant, so its contribution to the hybrid (a  $\delta^+$  charge on the carbonyl carbon) is also unimportant and can be ignored.



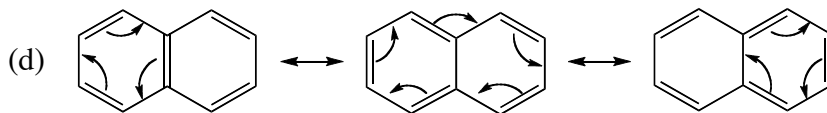
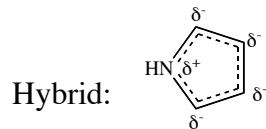
*Any other contributors violate so many rules that we would not consider them significant. Therefore this molecule has just two significant resonance contributors. The contributor with a full octet on each atom (second structure) is most significant.*



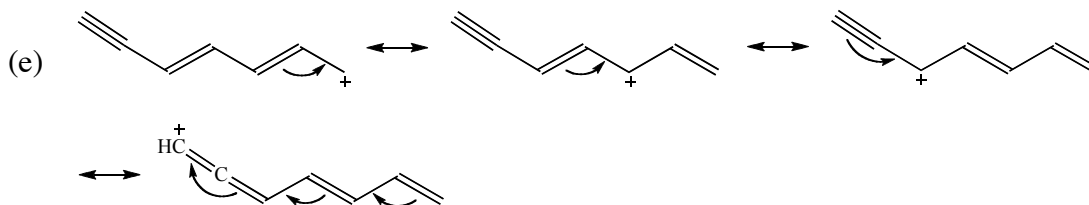
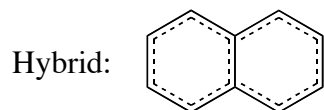
*The first and last contributors are most significant because they lack formal charge.*



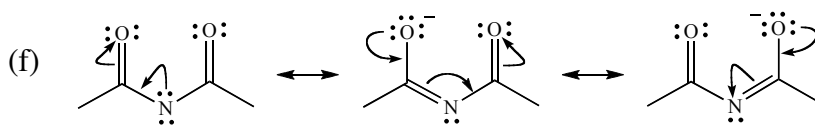
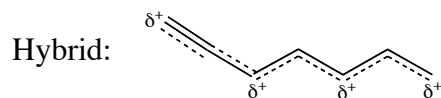
*The contributor that lacks formal charge (first structure) is the most significant.*



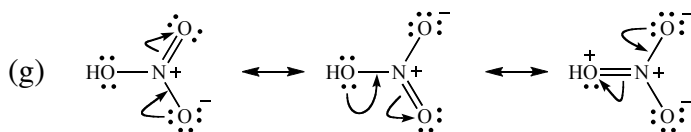
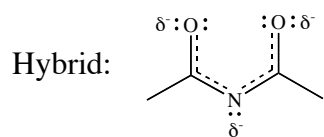
*All contributors are of equal significance.*



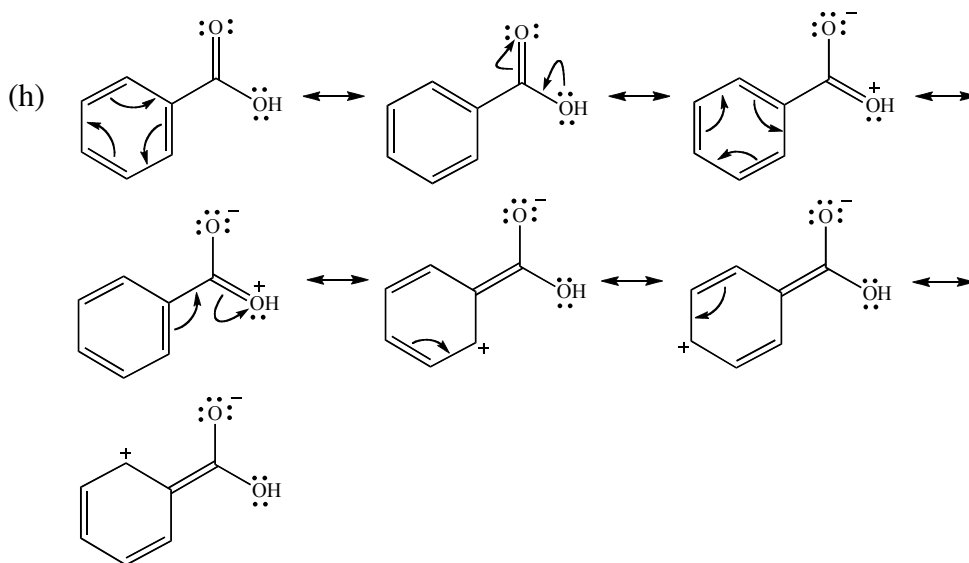
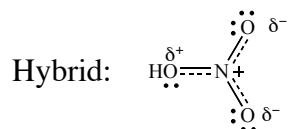
*All of these contributors have approximately equal significance.*



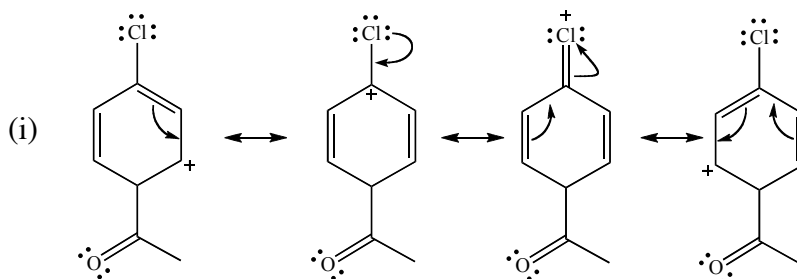
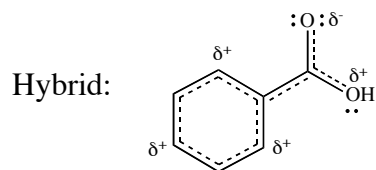
*The oxyanion contributors are of equal significance, and are more significant than the nitranion contributor.*



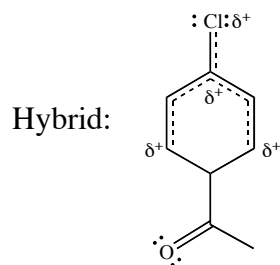
*The first two contributors are more important than the third because these two have fewer atoms with formal charges. The first two contributors are of equal importance.*



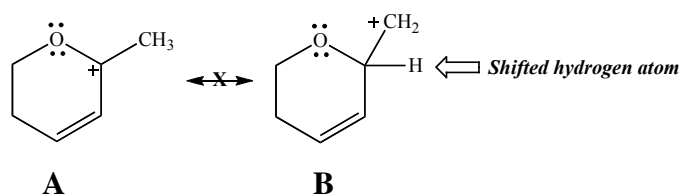
*The two contributors without formal charges are of equal significance, and are more important than the contributors with formal charges.*



*The contributor with a full octet on each atom and the most covalent bonds is the most significant, even though this has the formal positive charge on the most electronegative atom.*



2. (a) Resonance contributor B: This is not a resonance contributor related to structure A because it differs by the position of a hydrogen atom. *Atomic positions remain constant through all resonance contributors of a molecule.*



Resonance contributor C: This is not a resonance contributor related to structure A because it would have to have a carbon atom with ten valence electrons.

