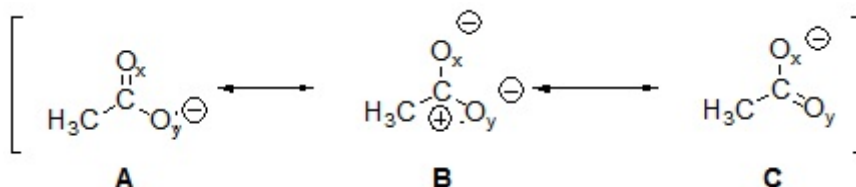


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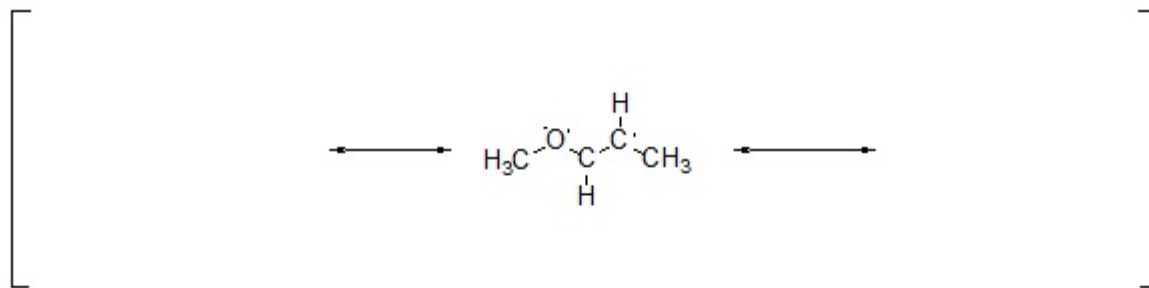
Resonance Structures (multiple representations of the same molecule)

Model 1: Acetate ion



1. What type of arrow is used to indicate that compounds are multiple representations of the same structure (resonance structures)?
2. What is the net overall charge on structures **A**, **B** and **C**?
3. Circle the bond in structure **A** that must be broken to provide structure **B**. Use a correct arrow to show this flow of electrons.
4. Show how structure **C** can be converted to structure **B** using correct arrow pushing of electrons.
5. Given that the more stable the resonance structure the greater contribution it has to the overall resonance hybrid (composite structure), which of the structures above contributes the least to the overall resonance hybrid? Justify your answer.
6. If atomic hybridization is retained from one structure to another, what is the atomic hybridization of O_x and O_y ?
7. Based upon the answer given in problem #6, lone pair electrons on oxygen that can be delocalized must occupy what type of atomic orbital?
8. The example shown in Model 1 represents one example of electron delocalization (resonance). If you were given a similar model to the one shown above, how would you recognize that the structure needed to be represented by multiple structures?

Model 2



9. Fill in any missing formal charges in the structure above.
10. A carbocation is a region of electron deficiency. Where might the carbocation in the structure above acquire electrons?
11. Draw two additional resonance structures representative of the structure above.
12. Rank each resonance structure in order of increasing contribution to the overall resonance hybrid. (1 is least significant, 3 is most significant). Justify your rankings.