

WORKSHOP - Second Term Review

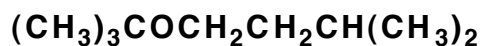
1. At this point, you have studied all the hydrocarbon functional group families (alkanes, cycloalkanes, alkenes, alkynes, polyenes, and aromatics) as well as functional groups with halogen, oxygen, or sulfur (singly bonded heteroatoms) plus C=O groups.

Create a chart that shows each of the major functional group families and show interconnecting arrows between the functional groups with the specific reaction conditions that would give those interconversions. Refer to the end-of-chapter summaries and attempt to include as many reactions as possible.

2. Organic reaction mechanisms may involve characteristic intermediates, such as cations, anions, radicals, or carbenes.

Create a chart that shows these four intermediates and identify reactions that generate these intermediates and reactions of these intermediates. Again, refer to the end-of-chapter summaries and attempt to include as many reactions as possible. For reactions that don't fit this organizing format, can you find other ways to add them to the chart?

3. Devise a synthetic sequence to create the following compound, using alkanes having four carbons or fewer as the only source of carbon. You may use any needed inorganic reagents and solvents.



4. There are numerous isomers of formula $\text{C}_4\text{H}_8\text{O}_2$. Four of them are esters. Write their structures and clearly indicate how they could be distinguished by proton NMR spectra.

Write structures for additional isomers having other functional groups and indicate how they could be distinguished from one another solely by IR spectra.