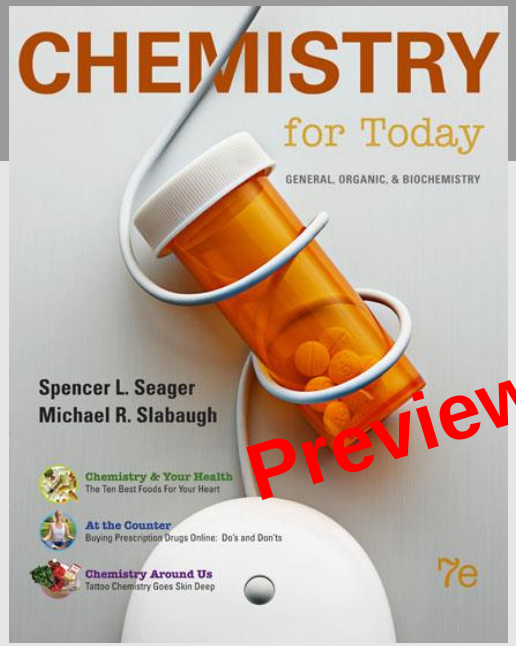
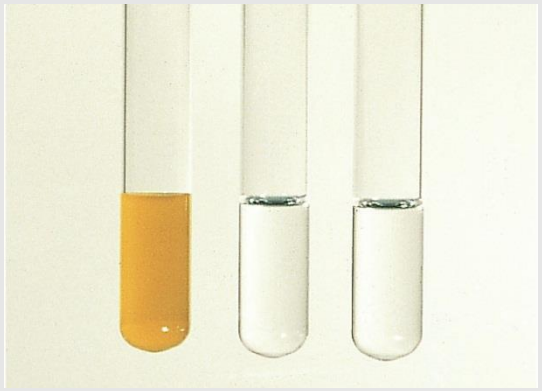


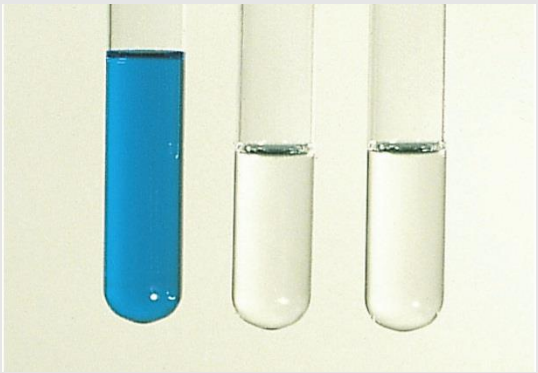
BROOKS/COLE CENGAGE Learning

Spencer L. Seager
Michael R. Slabaugh

www.cengage.com/chemistry/seager

Chapter 14
Aldehydes and Ketones

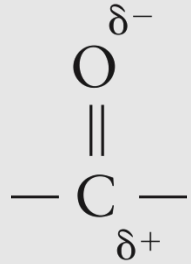




Jennifer P. Harris

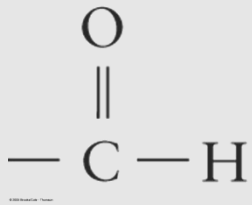
ALDEHYDES AND KETONES

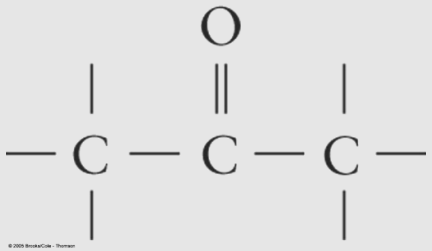
- The **carbonyl group**:

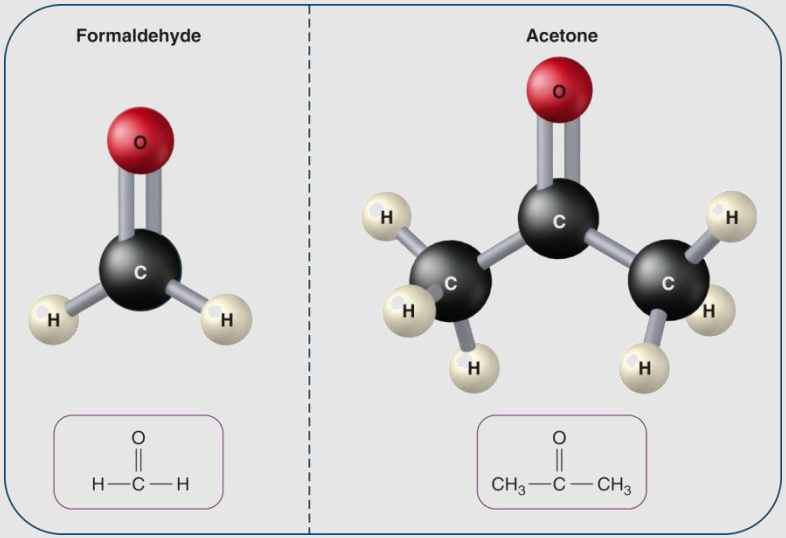


moderately polar due to the more electronegative oxygen atom

- **Aldehydes** have at least one hydrogen attached to the **carbonyl group**.
- **Ketones** have two carbons attached to the **carbonyl group**.

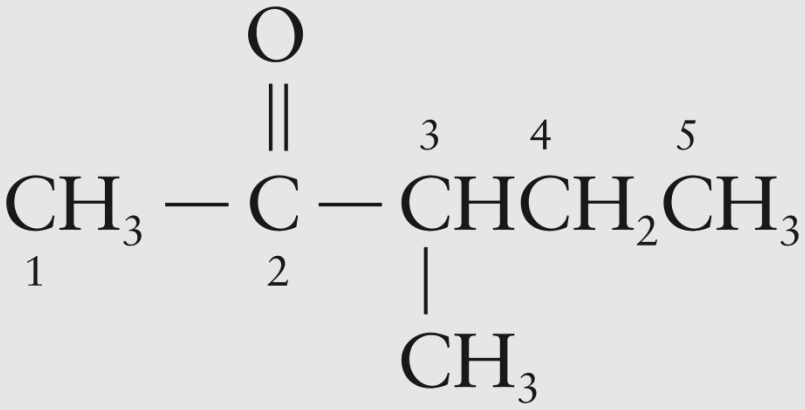




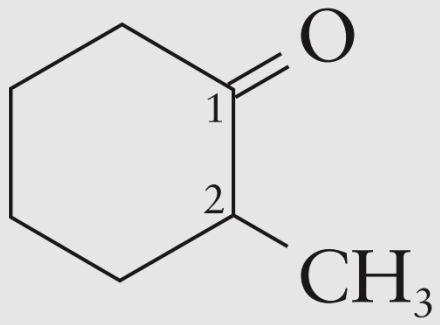


NAMING KETONES

- Find the longest chain that contains C=O.
- Using the root alkane name, drop the –e ending and change to –one.
- Number the longest carbon chain so the C=O group has the lowest number.
- Name and number other substituents as before.
- **Examples:**



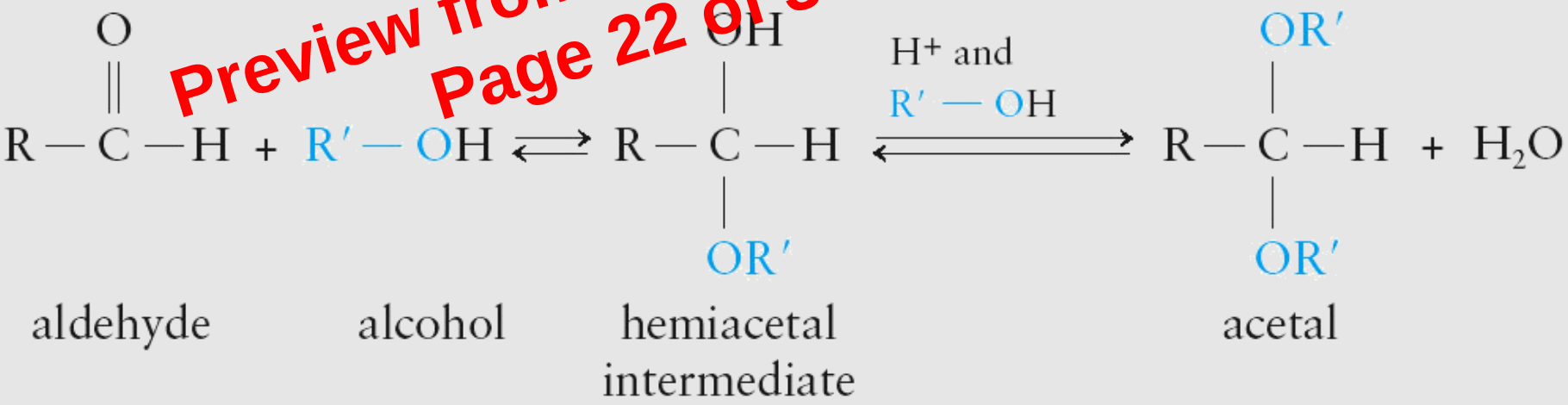
3-methyl-2-pentanone

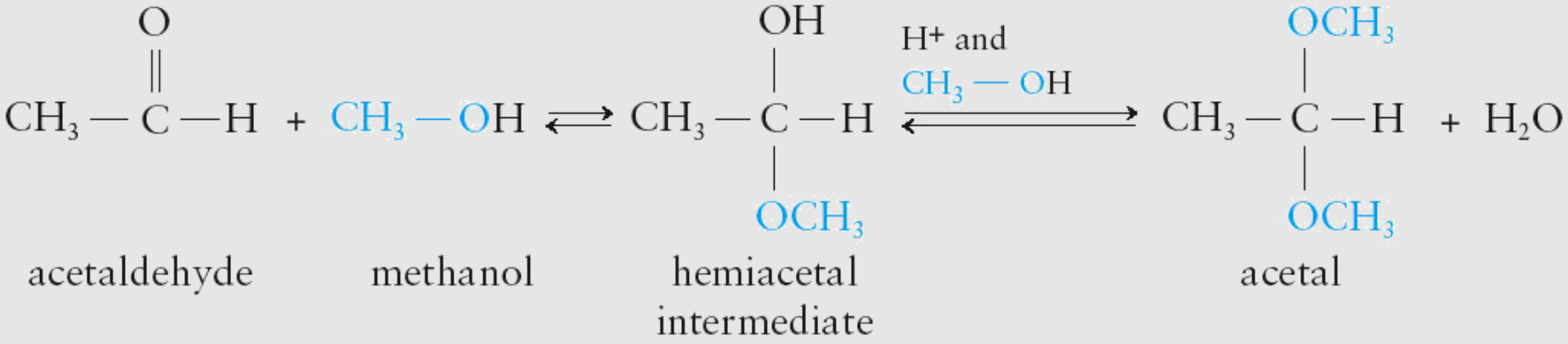


2-methylcyclohexanone

ALDEHYDE AND KETONE REACTIONS (continued)

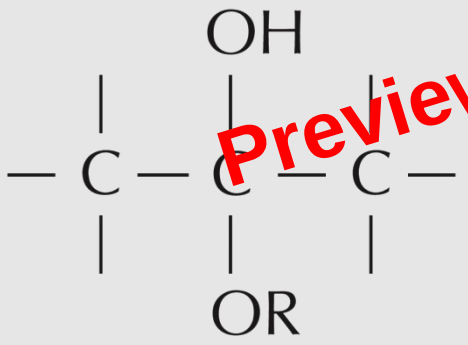
- The addition of alcohols to **aldehydes** produces an unstable **hemiacetal** intermediate



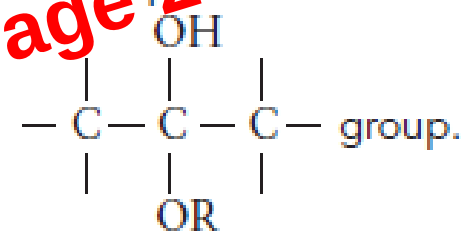


ALDEHYDE AND KETONE REACTIONS (continued)

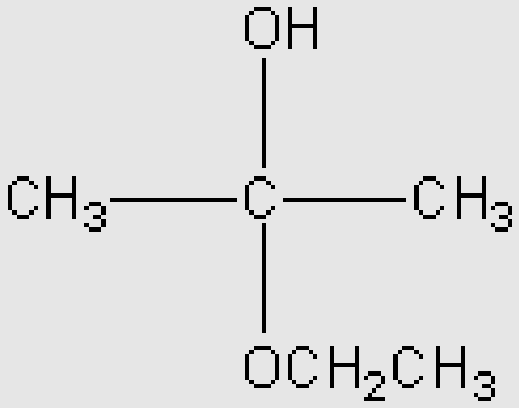
- **Hemiketal** general formula:



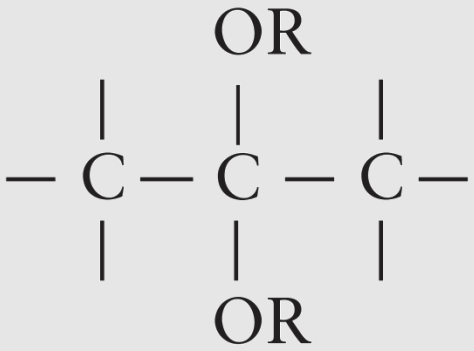
hemiketal
A compound that contains the



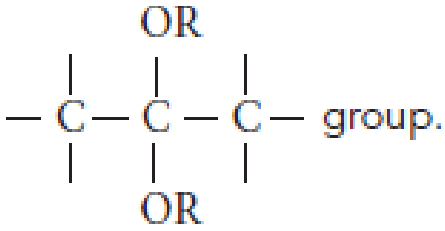
group.



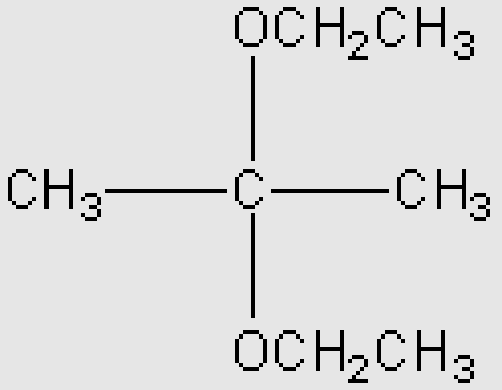
- **Ketal** general formula:



ketal
A compound that contains the



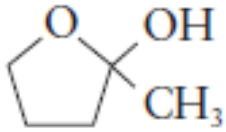
group.



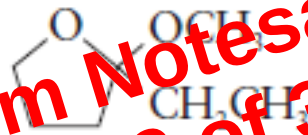
Example 4.4

Identify each of the following as a cyclic hemiacetal, hemiketal, acetal, or ketal:

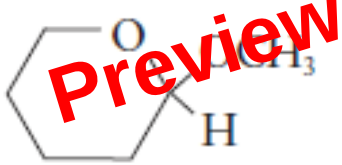
a.



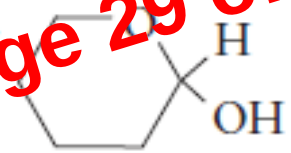
b.



c.



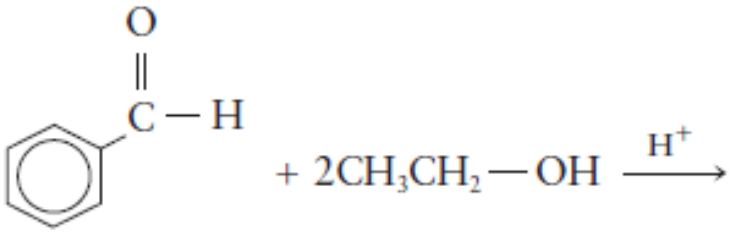
d.



Learning Check 4.5

Draw the structural formula for the hemiacetal and hemiketal intermediates and for the acetal and ketal products of the following reactions. Label each structure as a hemiacetal, hemiketal, ketal, or acetal.

a.



b.