

## 7.5: In-Text References

1. IUPAC is the International Union of Pure and Applied Chemists. This body is responsible (among other things) for setting the rules about systematic nomenclature of chemical substances. [↵](#)
2. The preparation of aldehydes and ketones has been discussed earlier, including reactions in which alkenes are cleaved (broken apart) by oxidation with ozone (ozonolysis) by addition of water across triple bonds (Chapter 5) and the oxidation of alcohols (Chapter 6). [↵](#)
3. Why do you think that pyruvate and lactate are present in the form of their conjugate bases? [↵](#)
4. Sometimes this grouping is called a ketal (when the starting  $C = O$  is a ketone), but general “acetal” and “hemiacetal” can refer to either an aldehyde or a ketone. [↵](#)
5. Remember, Le Chateliers Principle is just a rule of thumb—it tells us what happens but not why. Adding more reactants increases the rate of the forward reaction, removing products decreases the rate of the reverse reaction. [↵](#)
6. However, as we will see later, carbonyl compounds are often acidic; the alpha carbon can be deprotonated; more on that later. [↵](#)
7. See chapter 9 of CLUE general chemistry text for more information on the Henderson Hasselbalch equation and its uses. [↵](#)
8. The  $pK_a$  of protonated amines ( $RNH_3^+$ ) is about 10. Using the Henderson Hasselbalch equation, we see that the ratio of  $[RNH_2] / [RNH_3^+]$  is about 0.001—that is, there is 1000 times more protonated than unprotonated amine. [↵](#)
9. For a more in-depth discussion of this phenomenon, including the entropic and enthalpic contributions to micelle formation, see the CLUE Chapter 6. [↵](#)
10. Both  $HCl$  and  $SO_2$  are highly toxic, requiring special precautions—another one not to try at home. [↵](#)
11. Note that this stabilization uses d orbitals on the phosphorus; this reaction could not happen with an amine. [↵](#)
12. Species such as this carbanion are called ylides, because they can be written as containing both negative and positive charges on adjacent atoms (in contrast to Zwitterions: forms of amino acids at different pH's that also have both positive and negative charges on them—just not on adjacent atoms). [↵](#)
13. See <http://www.organic-chemistry.org/nam...-reaction.shtm> for example. [↵](#)
14. It functions (In at least one way, by binding to the protein tubulin: the structural basis of the cytoplasmic microtubules found in eukaryotic cells. When bound, Paclitaxel acts to make microtubules more stable (i.e. less likely to depolymerize). Since microtubule function depends on dynamic assembly and disassembly, this has effects on cell behavior, specifically microtubule-based cell division [↵](#)
15. The total synthesis of taxol is described here: <http://www.nature.com/nature/journal.../367630a0.html> [↵](#)

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