9.6: In-Text References

1. Of course this designation is entirely arbitrary, as backward and forward depend on how the initial reaction is written. ↵
2. We recognize such evolutionarily conserved processes because they used essentially (but not quite) the same reaction components and strategies. For example, aerobic respiration (whether in bacteria, potatoes, or humans) uses a structurally similar membrane system to transfer electrons from molecule to molecule (redox reaction). This generates an H^+ gradient then used by a rotatory protein "generator" to synthesize ATP. ↵
3. Amino acid chains are referred to as polypeptides; a protein is a functional unit, which can be composed of multiple polypeptides and non-polypeptide components such as heme groups. ↵
4. http://benbleasdaleblogs.wordpress.c...ide-your-nose/ ↵
5. This binding site can also be occupied by other types of molecules, in particular carbon monoxide (CO). Because the binding of O_2 to hemoglobin is much weaker and less stable than the CO^- hemoglobin interaction, exposure to CO blocks O_2 transport through the body, leading to suffocation. ↵
6. An explanation of how to do this is provided in the supplementary materials. ↵
7. It is always important to keep in mind that even though we write reaction equations with "sides" – product and reactant – in fact all these species are present in the same reaction vessel. ↵
8. By adding a small amount of solute (rather than a volume of solution) we will not significantly affect the volume of the solution - which will make determining the concentration easier. ↵
9. You might wonder why the amide nitrogen is not basic - even though it appears to have a lone pair of electrons. However these electrons are not available for donation because they are conjugated (interacting) with the $C=O$ group. You will have to wait until organic chemistry to hear more on this fascinating topic ↵
10. calculated from $\Delta G^\circ =- RT \ln K$ at physiologycal temperature $37^\circ C$ ↵
11. This occurs primarily because O_2 is in short supply and the aerobic respiration reaction cannot proceed to completion. ↵
12. Guyenet et al, 2010. Central CO_2 chemoreception and the integrated neural mechanisms of cardiovascular and respiratory control. J. Appl. Physiol. [online] 2010. 108, 995. http://www.ncbi.nlm.nih.gov/pubmed/20075262. ↵
13. Although it does not explain why we would want to exercise in the first place. ↵
14. Adapted from Physical Chemistry for the Chemical and Biological Sciences by Raymond Chang [complete citation] ↵