

7.7: In-Text References

1. That said, one might argue that 10^{-7} M is complete [↩](#)
2. Although slight traces of ethanol are still detectable; forensic scientists can detect the presence of substances such as hydrocarbons at the scene of a fire, even though the amounts are extremely small. [↩](#)
3. Arrhenius proposed these ideas in 1888 and won a Nobel Prize for his discovery of ionization reactions in solution in 1903. [↩](#)
4. <http://www.nature.com/nature/journal.../397601a0.html> [↩](#)
5. This theory was postulated simultaneously by both Brønsted and Lowry in 1923. [↩](#)
6. In strong acids, the proton is completely donated to water in aqueous solution (i.e., there is no detectable amount of un-ionized acid in the water). [↩](#)
7. Recall also that electronegativity stems directly from the effective nuclear charge on a particular atom. If you don't remember why, go back to chapter 2 and review this important idea. [↩](#)
8. Although some highly-charged metal ions react with water, we will not consider these reactions at the moment. Group I and II cations are stable in water. [↩](#)
9. There are some nitrogenous compounds that are not basic because the lone pair is already being used for some other purpose. If you continue to study organic chemistry, you will learn about these ideas in more detail. [↩](#)
10. Note reactions between molecules are intermolecular reactions; those that involve a single molecule are intramolecular. [↩](#)
11. <http://www.springerlink.com/content/n274g10812m30107/> [↩](#)
12. In fact K_w increases with temperature due to Le Chatelier's principle, about which we will have more to say shortly. [↩](#)
13. The pH scale was first developed in 1909 by Danish biochemist Søren Sørensen. [↩](#)
14. In fact, pH is better defined as $\text{pH} = \{ \text{H}_3\text{O}^+ \}$, where the $\{ \}$ refer to the activity of the species rather than the concentration. This is a topic better left to subsequent courses, although it is important to remember that any resulting calculations on pH using concentrations provide only approximations. [↩](#)
15. Litmus is a water-soluble mixture of different dyes extracted from lichens, especially *Roccella tinctoria*— Wikipedia! [↩](#)
16. pH is typically measured by using a pH meter that measures the differences between the electrical potential of the solution relative to some reference. As the concentration of hydronium ion increases, the voltage (potential between the solution and the reference) changes and can be calibrated and reported as pH. [↩](#)
17. <http://www.bbc.co.uk/dna/h2g2/A8819652> [↩](#)
18. <http://www.ncbi.nlm.nih.gov/pmc/arti...00237-0011.pdf> [↩](#)
19. This is based on the personal memories of one (and only one) of the authors. [↩](#)
20. Visit http://www.youtube.com/watch?v=eCk0LYB_8c0 for an entertaining video of what happens when sodium and other alkali metals are added to water (yes, they probably faked the cesium). [↩](#)
21. Hydrogen and oxygen can be used as rocket fuel, and the so-called “hydrogen economy” is based on the energy released when hydrogen reacts with the oxygen from the air. [↩](#)
22. <http://www.youtube.com/watch?v=oXHtOjXxvRo> [↩](#)
23. When O_2 is used, the process is known as aerobic respiration. [↩](#)
24. Although bond dissociation energy and bond energy are often used interchangeably, they are slightly different. Bond dissociation energy is the energy required to break a particular bond in a molecule; bond energy is the average energy required to break a bond of that type. For our purposes, the difference is not important. Tables of bond energies usually refer to average bond energies. [↩](#)
25. Species with unpaired electrons [↩](#)
26. To begin this calculation, you must be able to figure out what bonds are present in the molecule; you must be able to draw the Lewis structure. [↩](#)

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