

4.7: In-Text References

1. We do not believe that their intent is to torment students, and perhaps they have just forgotten that not every student knows or remembers all of the rules. ↩
2. Unless otherwise noted, we always consider melting and boiling points at atmospheric pressure. ↩
3. Chemists are not being unnecessarily difficult; anatomists also have a very strict set of names for the various bones and nerves in the body, in part to avoid confusion during medical procedures. ↩
4. <http://www.iupac.org/> and <http://goldbook.iupac.org/index.html> ↩
5. Hydrocarbons contain only hydrogen and carbon. Be careful not to confuse them with carbohydrates, which contain carbon, hydrogen, and oxygen and include sugars. We will consider carbohydrates in more detail later on. ↩
6. In fact, we will see that these rotations and vibrations are quantized! ↩
7. <http://pubs.acs.org/doi/full/10.1021/ci0497657> ↩
8. However, a nitrogen compound with some structural similarities to diamond has been identified. It was synthesized from N₂ at high pressure and temperatures. In this polymeric nitrogen, each nitrogen is connected to three neighbors via single bonds, in a similar way that diamond has carbons connected to four neighbors. However this polymeric nitrogen is highly unstable and reactive – unlike diamond. <http://www.nature.com/nmat/journal/v.../nmat1146.html> ↩
9. Interestingly O₂ cannot be well described by a simple valence bond model, because it can be shown that molecular oxygen has two unpaired electrons (it is a di-radical). The bonding is best explained by using molecular orbital theory. ↩
10. Another way to talk about polarity is to say the bond (or molecule) has a dipole moment (unit Debye)- that is the magnitude of the charges × distance separating them. ↩
11. It is worth keeping in mind the distinction between the molecules a substance is composed of, and the substance itself. Molecules do not have a boiling point, substances do. ↩
12. Remember what a mole is, and that a kilojoule (kJ) is a unit of energy. ↩
13. In larger molecules, such as proteins and nucleic acids, H-bonds can also form between distinct regions of a single molecule. ↩
14. While Davy is well known now for his experiments on the nature of salts, he began his chemical career in his early twenties researching medical uses of gases. He apparently became very fond of nitrous oxide (N₂O, laughing gas), which he reported was an enjoyable recreational drug and a cure for hangovers (ref SALT). ↩
15. In 1800 the first electric battery, the Voltaic Pile, was developed. It was promptly put to use by a growing number of scientists. For example, molecular hydrogen and oxygen could be produced by passing electricity through water. ↩
16. Positively charged ions are known as cations and negatively charged ions are known as anions. ↩

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