**Some specific points about the language of Chemistry (Geoffrey Neuss 2016)**

**1. Formulas of substances**

Elements containing two atoms in a molecule (diatomic) are written as such but if there are more than two atoms in a molecule of the element (polyatomic) the element is often written as if only one atom is present, e.g.

S + O2 → SO2

In fact S + 2O → SO2 is more consistent and S8 + 8O2→ 8SO2 is more correct.

**2. Order of elements in a compound**

Usually the more electropositive element comes first, e.g. NaCl and H2O. Logically ammonia and methane should therefore be H3N and H4C respectively.

**3. Physical constants**

Should be written in italics. e.g. *R* – the gas constant; *K* – the equilibrium constant, *k* – the rate constant.

**4. Shorthand notation**

[X] is shorthand for ‘the concentration of X’ – although actually it is the activity of X and has no units.
This causes a problem when calculating equilibrium constants for the IB since if X is in mol dm-3 then the equilibrium constant may have units whereas in reality they do not have units.

**5. Different meanings of words in English and Chemistry**Words such as strong, spontaneous and reduce have very specific and different meanings in Chemistry compared to everyday English [[1]](http://www.thinkib.net/chemistry/page/3510/language-of-chemistry%22%20%5Cl%20%22fn-b1).

**6. Words with different meanings within Chemistry**Stable can mean thermodynamically stable or it can mean kinetically stable and should not be used on its own.

**7. The Greek alphabet**We assume students know the Greek alphabet as we frequently use Greek letters which have chemical meanings, e.g. Δ, π and σ.

**8. The use of commas and full stops**6,290,  6.290 and 6.290 can all mean the same thing and can all mean completely different things.

**9. Reciprocal units**Concentration can be expressed as mol dm-3, mol L-1, mol/dm3, mol per litre, mol/l, and M. Since miles per hour is often shortened to mph presumably concentration could also be molpl!

**10. Oxidation numbers/molecular mass**

When determining oxidation numbers chemists assume that covalent compounds are ionic, e.g. CH4 (C= -4; H= +1). However when referring to ‘molecular mass’ ionic compounds cannot be assumed to be molecular so the term cannot be used for ionic compounds and we have to use ‘formula mass’ instead..

**11. Organic structures**It is normal to use angles of 90o when drawing the structures of alkanes even though they are tetrahedral in shape with bond angles of 109.5o.

**12. Representation of radicals**

A chlorine atom is represented by Cl but a chlorine radical (which is also a chlorine atom) is represented by Cl or Cl**.**. A methyl radical which is neutral is represented by CH3,  CH3**.** or CH3­­– even though "–" normally means a pair of electrons.

**13. Using tautology**

The initiation step in free radical substitution reactions involves *homolytic fission* – this translates literally as same breaking breaking.

**14. The difference between oxidation number and oxidation state**

For example, in FeO the oxidation number of Fe = +2 and the oxidation state of Fe = (II)

**15. Reading from right to left or left to right when numbering organic compounds**

HOCH2CH2CH3 and CH3CH2CH2OH are both propan-1-ol

**16. Use of upper and lower case for constants**

*K*is the equilibrium constant; *k* is the rate constant.