Entering equations and formulas in Connect.

Example: $16H^{+}(aq) + 2MnO_4^{-}(aq) + 10Cl^{-}(aq) \rightarrow 2Mn^{2+}(aq) + 5Cl_2(g) + 8H_2O(l)$

How to enter this equation (the key is NOT using the subscript or superscript buttons until you have typed the entire equation):

- Put your cursor in the answer box; the "answer palette" will appear.
- Type 16H+; choose the (aq) button from the answer palette.
- Without using any spaces, type +2MnO4– (remember that a charge of negative one is entered as – and NOT as –1; same goes for positive one charge: +, NOT +1) and then choose the (aq) button from the answer palette.
- Without using any spaces, type +10Cl– and then choose the (aq) button from the answer palette.
- Without using any spaces, choose the right arrow button from the answer palette.
- Without using any spaces, type 2Mn2+, then choose the (aq) button from the answer palette.
- Without using any spaces, type +5Cl2, then choose the (g) button from the answer palette.
- Without using any spaces, type +8H2O, then choose the (*l*) button from the answer palette.
- **Now that you have entered the equation, go back and one by one, highlight each number that is to be subscripted and choose the subscript button from the answer palette; this button is in the top row of the answer palette, the second button from the left.**
- **Then go back and, one by one, highlight each number or + or – sign and number that is to be superscripted and choose the superscript button from the answer palette; this button is in the top row of the answer palette, the first button from the left.**
- If you make a mistake and have extra boxes in the equation, it is best to delete everything (using the trash can icon in the answer palette) and start over.

Chapter 4 – Three Major Classes of Chemical Reactions
(All Sections)

Solvents and Solutes

When sugar is dissolved in water to form a solution, we refer to water as the solvent and sugar as the solute.

We often categorize solvents as being polar or non-polar. Solutes can also be classified as molecular (no ions formed) or ionic. Ionic solutes are, by definition, polar. Molecular solutes can range from non-polar to highly polar.

Water, a very polar substance, is the most common solvent, but there are many relatively common non-polar solvents, such as hexane, C_6H_{14}, a substance similar in structure to those which are found in gasoline.

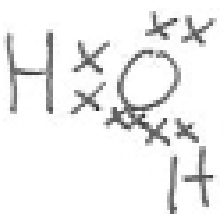
a hydrocarbon

Water as a Solvent

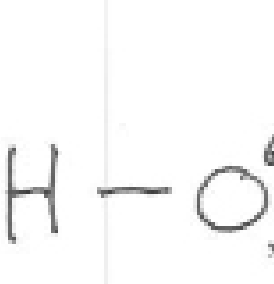
Whenever we speak of liquid solutions, water is the solvent unless otherwise noted.

Water is a molecular substance. It is not ionic. Although the water molecule is neutral in charge and contains no ions, there are regions of positive and negative character within the water molecule

These regions of positive and negative character are due to the high electronegativity (attraction for electrons) of the oxygen atom and the low electronegativity of the hydrogen atoms.

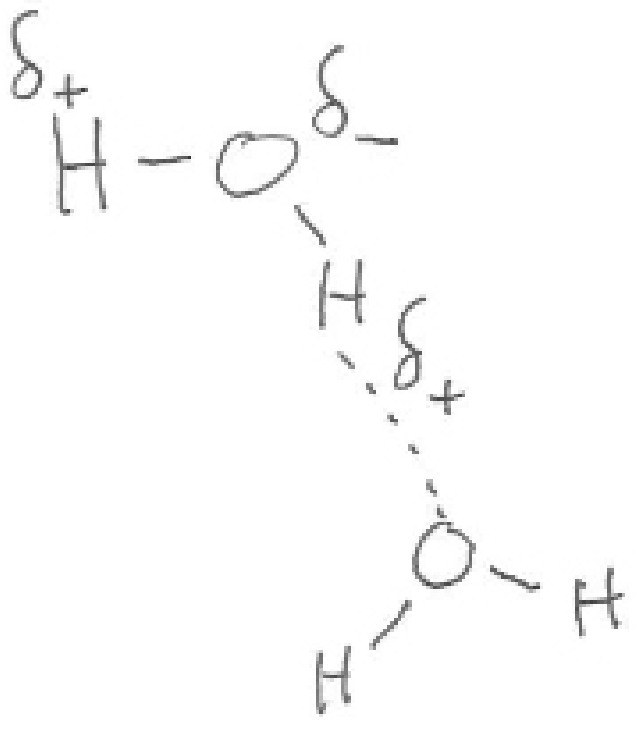


O has a far greater affinity for electrons than H.



negative character

positive character



The H_2O molecule has distinct regions of + and - character and we say that it is a POLAR molecule.