Bar Graph showing concentrations of species in solution

(water is not included in these graphs as it has a very high concentration of 55.5 molL-1)

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| The **salts** below dissolve fully in water,  there are many ions free to move and carry a charge, so these aqueous solutions are good electrolytes  pH = 7 as [H3O+] = [OH-] | | |
| NaCl    H3O+  Cl-  Na+  OH-  NaCl (s) 🡪 Na+ (aq) + Cl- (aq)  there is no such thing as NaCl (aq) | CaCl2    OH-  H3O+  Ca2+  Cl-  CaCl2(s) 🡪 Ca2+(aq) + 2Cl-(aq)  notice that conc of Cl- ions is twice  OH-  Cl-  conc Ca2+ ions | CaSO4    Ca2+  SO42-  OH-  H3O+  CaSO4(s) 🡪 Ca2+ (aq) + SO42-(aq)  Na+  CaSO4 is only slightly soluble  so all concentrations are lower |

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| The following solutions all have [OH-] > [H3O+] so the pH > 7  They are also good electrolytes as there are ions free to move in solution and carry a charge | | |
| CH3COONa in water    CH3COO-  H3O+  OH-  Na+  CH3COOH  CH3COONa(s) 🡪 Na+(aq) + CH3COO-(aq)  CH3COO-(aq) + H2O ⇌ CH3COOH(aq) + OH-(aq) | NaOH in water  strong base    H3O+  Na+  OH-  NaOH(s) 🡪 Na+(aq) + OH-(aq) | Ca(OH)2 in water  strong base    OH-  Ca2+  H3O+  Ca(OH)2(s) 🡪 Ca2+(aq) + 2OH-(aq) |
| NH3 in water  weak base    OH-  NH3  NH4+  H3O+  NH3(aq) + H2O ⇌ NH4+(aq) + OH-(aq) |  |  |

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| The following solutions all have [H3O+] > [OH-] so the pH < 7  They are good electrolytes as there are ions free to move in solution and carry a charge | | |
| HCl in water  a strong acid    OH-  Cl-  H3O+  HCl(aq)+ H2O 🡪 H3O+(aq) + Cl- (aq) | CH3COOH in water  a weak acid    CH3COO-  H3O+  OH-  CH3COOH  CH3COOH(aq) + H2O ⇌ CHCOO-(aq) + H3O+(aq) | NH4Cl in water  a salt    Cl-  NH4+  H3O+  NH3  OH-  NH4Cl(s) 🡪 NH4+(aq) + Cl- (aq)  NH4+ (aq) + H2O ⇌ NH3(aq) + H3O+(aq)  Ca2+ |

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| very soluble in water  but a poor conductor of electricity as there are few free ions to carry a charge  neutral pH |  | insoluble  poor conductor of electricity  neutral pH |
| CH3CH2OH    CH3CH2OH  H3O+  OH-  CH3CH2OH(l) 🡪 CH3CH2OH(aq) |  | C6H12    OH-  H3O+  as cyclohexane is insoluble,  the concentrations of species present  in water is unchanged |

Reference: edited from <http://moodle.lynfield.school.nz/mod/resource/view.php?id=11521>

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