**Revision questions on acids and bases, and gases**

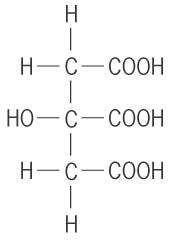
1. Nelson chem P:325 look at the table C7.3 pH and OH- ion concentration
2. What is the relationship between pHand the concentration of hydrogen ions (H+)?
3. What is the relationship between the concentration of H+ and the concentration of OH⁻ in a solution?
4. Which one will have the lowest pH?

HCl, H2SO4, HNO3 and CH3 COOH

1. Define Arrhenius theory of acids and bases.
2. NC: Page: 348- Different properties gases
3. NC: P: 346- Kinetic theory of gases
4. Boyles law, Charles law and combined gas law
5. Spectator ions
6. Write an equation for the dissociation of a **strong** base. What do you mean by the term “strong”.
   * 1. Write a balanced molecular equation, including state symbols
     2. Write an ionic equation. In the ionic equations you should only show reacting species.
     3. Give a full set of observations for the reaction, including the colours of solutions and solids, and colour and odour of any gases formed.

If no reaction occurs you should state this. If no visible reaction occurs write “no visible reaction” for the observation.

1. solid copper(II) hydroxide is added to a solution of hydrochloric acid
2. A solution of potassium hydroxide is mixed with a solution of phosphoric acid.
3. Crystals of ammonium chloride are stirred into a solution of sodium hydroxide.
4. An excess of potassium carbonate solution is added to a small amount of nickel(II) sulfate.



* **Monoprotic acids:**
  + Only contain one ionisable hydrogen atom Examples: **H**Cℓ, **H**NO3, CH3COO**H**
  + **Polyprotic acids:**
  + Contain multiple ionisable hydrogen atom Diprotic: **H2**SO4, **H2**CO3 Triprotic: **H3**PO4
  + Each ionisation step can be shown separately… *(successive ionisation)*
    - **H3**PO4(aq) ⇌ **H**+(aq) + **H2**PO4-(aq)
    - **H2**PO4-(aq) ⇌ **H**+(aq) + **H**PO42-(aq)
    - **H**PO42-(aq) ⇌ **H**+(aq) + PO43-(aq)

…or summarised into a single equation

* + - **H3**PO4(aq) ⇌ **3 H**+(aq) + PO43-(aq)

* **Citric acid (C6H8O7) is a weak, triprotic acid.**   
    
  Write a successive ionisation equations for citric acid.

C6H8O7(aq) ⇌ C6H7O7-(aq) + H+(aq)

C6H7O7-(aq) ⇌ C6H6O72-(aq) + H+(aq)

C6H6O72-(aq) ⇌ C6H5O73-(aq) + H+(aq)

1. Write a balanced equation for lead nitrate and potassium iodide
2. Litmus and universal indicator tests with acids and bases
3. Reaction of barium hydroxide and sulphuric acid
4. A metal container filled with a gas and closed the lid. When placed in a cold liquid what happens to the pressure inside the container?
5. What will happen if a metal is going to be reacted with HCl. Explain with an example, show the equation.
6. Learn problems connected with n= m/M, c= n/v, n= v/ 22.71