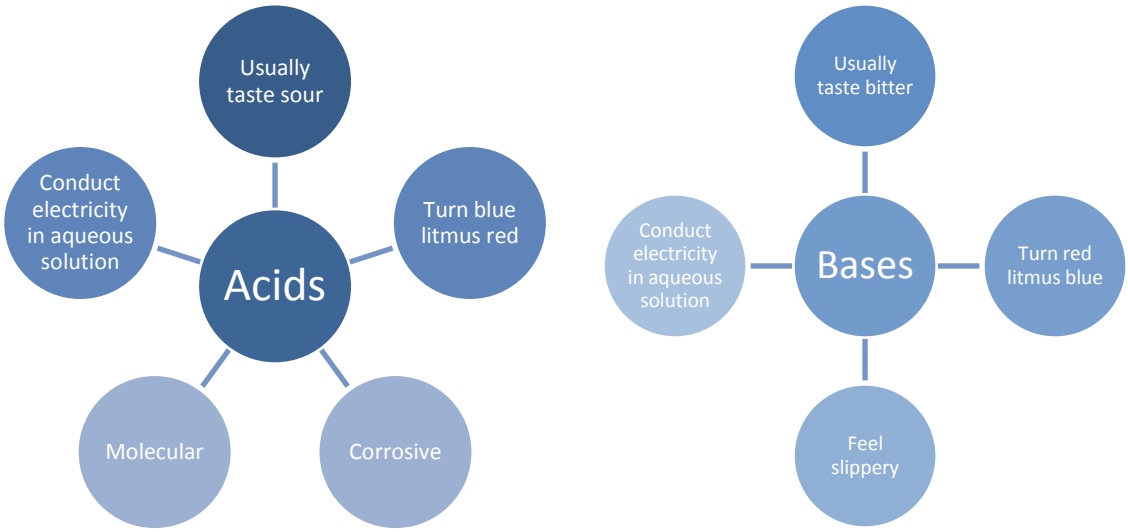
8.2 – Properties of Acids and Bases

8.2.1 - Outline the characteristic properties of acids and bases in aqueous solution



Note that an **alkali** is a base that dissolves in water.

Reactions of Acids

Reaction with a **metal** to form a salt and hydrogen gas. Exceptions are Cu, Hg and Ag.

$$2HCl_{(aq)} + Mg_{(s)} \rightarrow MgCl_{2\,(aq)} + H_{2\,(g)}$$

Reaction with a **metal hydroxide** to form a salt and water.

$$2HCl_{(aq)} + Mg(OH)_{2\,(s)} \rightarrow MgCl_{2\,(aq)} + 2H_2O_{(l)}$$

Reaction with a **metal oxide** to form a salt and water

$$2HCl_{(aq)} + MgO_{(s)} \rightarrow MgCl_{2\,(aq)} + H_2O_{(l)}$$

Reaction with **metal carbonate** to produce a salt, water and carbon dioxide

$$2HCl_{(aq)} + MgCO_{3\,(s)} \rightarrow MgCl_{2\,(aq)} + H_2O_{(l)} + CO_{2\,(g)}$$

Reaction with a **metal hydrogen carbonate** to form a salt, water and carbon dioxide

$$2HCl_{(aq)} + Mg(HCO_3)_{2\,(s)} \rightarrow MgCl_{2\,(aq)} + 2H_2O_{(l)} + 2CO_{2\,(g)}$$

Reactions of Bases

Reaction of an **alkali** with an **acid** to form a salt and water

$$NaOH_{(aq)} + HCl_{(aq)} \rightarrow NaCl_{(aq)} + H_2O_{(l)}$$

Reaction of a **metal oxide** with an **acid** to form a salt and water

$$MgO_{(s)} + 2HCl_{(aq)} \rightarrow MgCl_{2\,(aq)} + H_2O_{(l)}$$

Reaction of a **metal hydrogen carbonate** with an **acid** to product a salt, water and carbon dioxide

$$Na_2CO_{3\,(s)} + 2HCl_{(aq)} \rightarrow 2NaCl_{(aq)} + H_2O_{(l)} + CO_{2\,(g)}$$

Reaction of a **hydrogen carbonate** with an **acid** to form a salt, water and carbon dioxide

$$NaHCO_{3\,(s)} + HCl_{(aq)} \rightarrow NaCl_{(aq)} + H_2O_{(l)} + CO_{2\,(g)}$$

Reaction of **ammonia** with an **acid** to produce an ammonium salt

$$NH_{3\,(aq)} + HCl_{(aq)} \rightarrow NH_4Cl_{(aq)}$$

Response to Indicators

Indicators change colour depending on the pH. Acids will cause the pigment for show a different colour from bases.