

Common acids and alkalis

Most people think **acids** are dangerous, and **some** are. Concentrated **sulfuric acid** is **very corrosive**, and must be handled with care. But other acids are common chemicals that we use every day. **Acetic acid** - also called **ethanoic acid** - is present in vinegar. **Citric acid** is found in fruits such as oranges and lemons. These acids are safe to eat.

It is a similar story with alkalis. A concentrated solution of the alkali **sodium hydroxide** is **very caustic**. It can be used to remove skin from bones to obtain skeletons. But **magnesium hydroxide** is such a mild alkali it can be taken as an indigestion remedy.

Acids and alkalis that are dangerous are stored in containers which have hazard warning signs to show they are corrosive. These chemicals need to be handled with care, with goggles and gloves worn.



Corrosive
hazard
warning

The table lists some common acids and alkalis:

Common acids and alkalis

Name	Formula	Acid or alkali	Information
citric acid	$\text{COH}(\text{CH}_2)_2(\text{COOH})_3$	acid	solid, found in citrus fruit
tartaric acid	$(\text{CHOHCOOH})_2$	acid	solid, found in tea
sulfuric acid	H_2SO_4	acid	liquid, used in car batteries
nitric acid	HNO_3	acid	liquid
ethanoic acid	CH_3COOH	acid	liquid, used in vinegar
hydrogen chloride	HCl	acid	gas, dissolves in water to make hydrochloric acid
sodium hydroxide	NaOH	alkali	solid, used in oven cleaners
potassium hydroxide	KOH	alkali	solid
calcium hydroxide	$\text{Ca}(\text{OH})_2$	alkali	solid, also called 'lime'

Acids and alkalis

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The pH scale

It is possible to tell if a solution is **acidic** or **alkaline** by using an **indicator**. An indicator is a substance which has different colours when it is in acidic or alkaline conditions. Litmus is probably the most well-known indicator. This is **red in acids** and **blue in alkalis**. Litmus can be used as a liquid, or as litmus paper.

Solutions of acids and alkalis can vary widely in their acidity and alkalinity. It is useful to know not just whether a solution is an acid or an alkali, but **how** acidic or how alkaline it is. To measure acidity and alkalinity, we can use the **pH scale**.

The easiest way to do this is to use Universal indicator. This is a mixture of several different indicators, and can be used as a liquid or paper. It has many different colour changes.

The colour of the Universal indicator shows the pH value of the solution. The pH scale runs from **pH 0 to pH 14**.

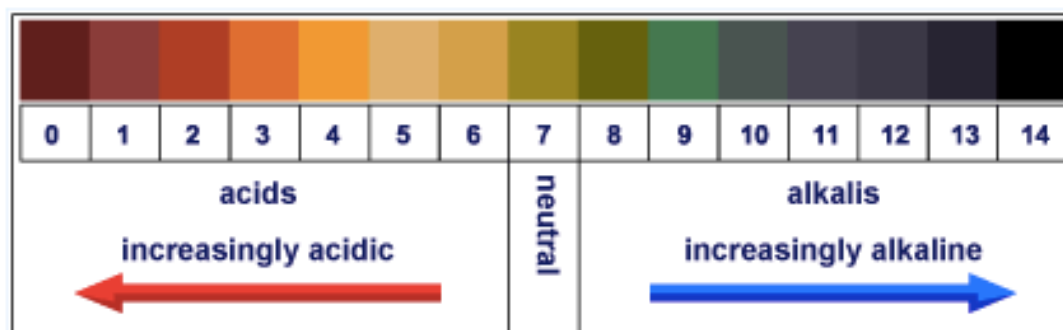
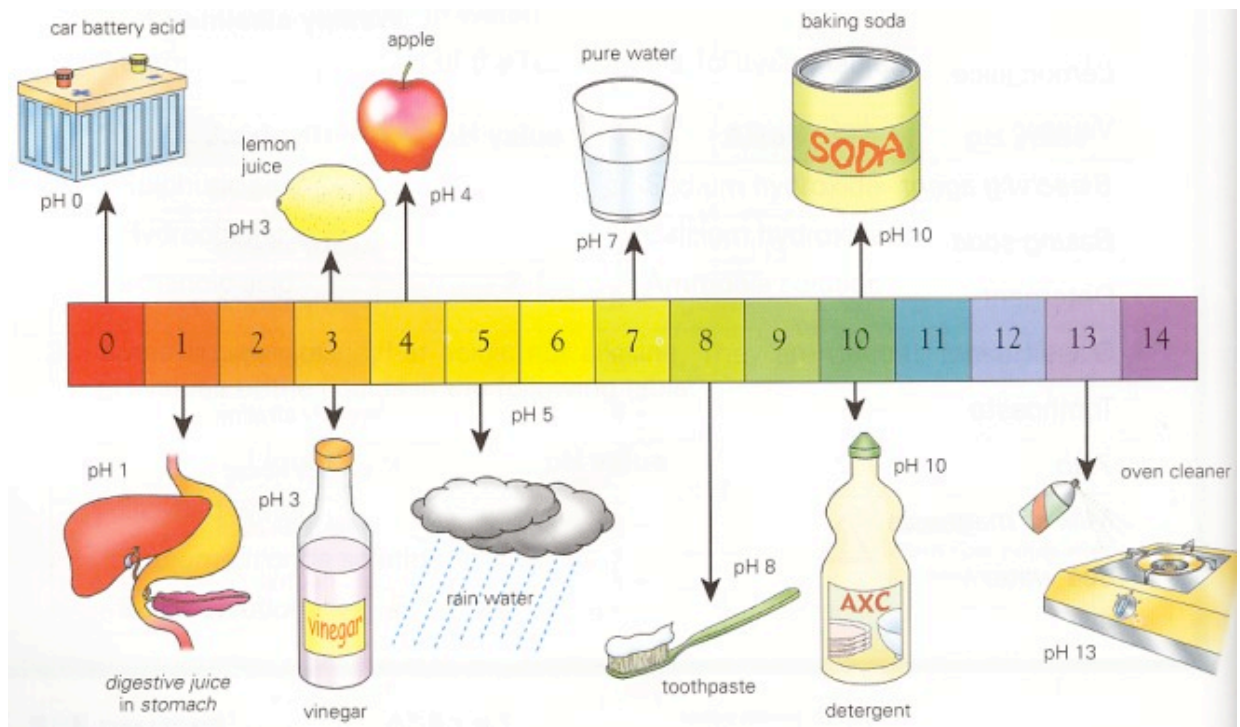


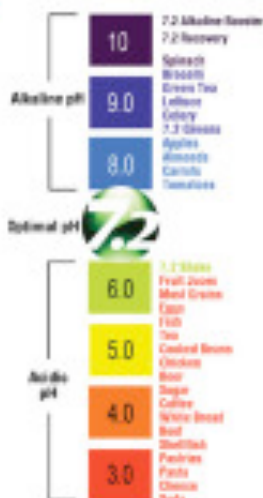
Diagram of pH scale and universal indicator colours



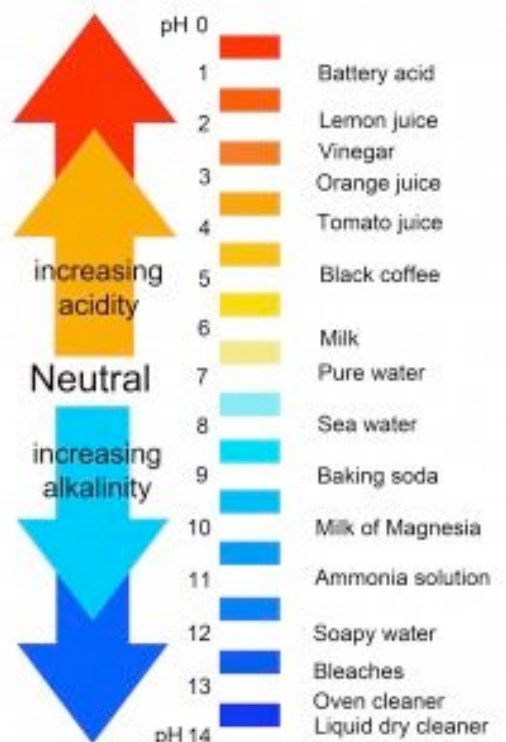
The pH Scale



Acid Forming Foods



Alkaline Food Choices



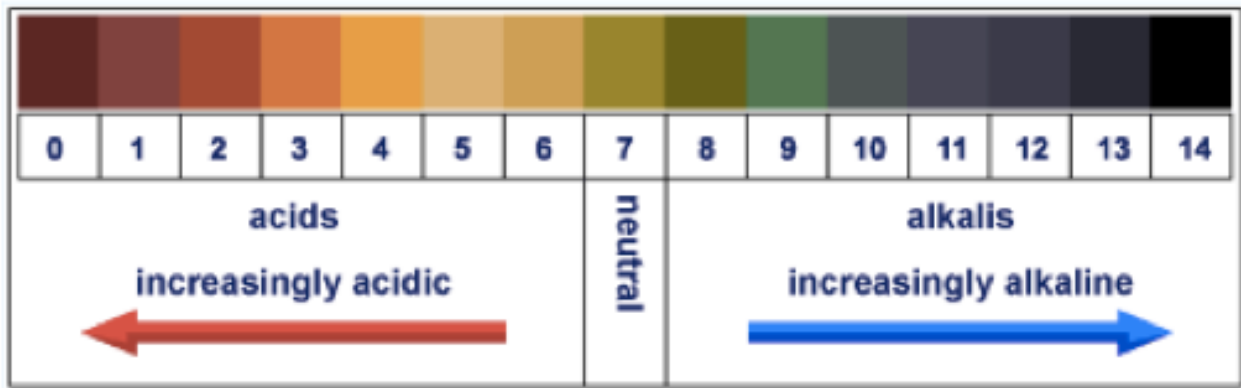


Diagram of pH scale and universal indicator colours