

Reagents :-

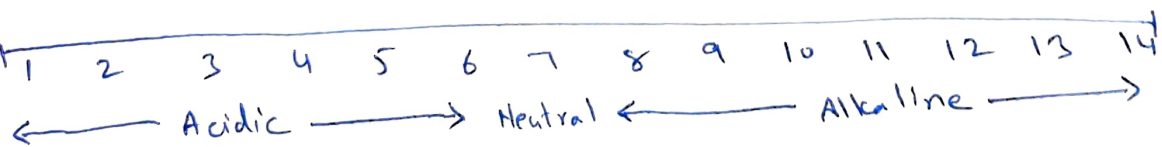
a substance used to cause a chemical reaction, especially in order to find out if another substance is present.

Reagents are added to cause a chemical reaction or test if one occurred.

These bring about cleaning by a chemical reaction requiring a distinctly low or high pH.

They thus include acids and alkalis that aid in the cleaning process. To understand the action of acids and alkalis one must have knowledge of the term pH. pH is ~~the~~ a measurement of the level of acid or alkali in a solution or substance.

In the pH range of 0 to 14, a reading below 7 shows an acid one above 7 shows an alkali.



pH scale

Types of reagents

Reagents may be acids or alkalis.

Acids Acids used as cleaning agents may vary from mild acids (such as acetic acid) with a pH of 3 to strong acids (such as dilute or concentrated hydrochloric acid) with a pH of 1. Mildly acidic substances used commonly in cleaning include lime, vinegar, tamarind, and buttermilk. Acids may be used in solution alone or may be part of some special formulations, as in toilet cleaners. *Housekeeping staff need to be trained in the safe handling of strong acids, as they are highly corrosive. They literally 'eat away' dirt. Rubber gloves should always be used while handling them. They should be used in very small quantities as they emit toxic fumes as well. Strong acids should be thoroughly rinsed away after the cleaning process.* Table 7.7 summarizes the use of different acids in cleaning.

Table 7.7 Acids and their use in cleaning

Acid	pH	Uses
Concentrated HCl (once referred to as 'spirits of salt')	1	Removing stubborn hard-water deposits.
Dilute HCl	1	Removing stubborn scales and deposits from sanitaryware. Removing excess cement from newly cemented tiled areas.
Oxalic acid	2	Removing stubborn hard-water deposits.
Acetic acid	3	Removing tarnish and stains from metals such as copper and brass (the acid must be washed off quickly). Neutralizing alkalis used in cleaning. Preventing colours from running during washing.
Sodium acid sulphate	5	Removing hard-water deposits and scales from toilets.

Alkalis These are used as cleaning agents in the form of liquids and powders. They are particularly useful in the laundry. *Very strong alkalis should be used with the utmost caution as they are corrosive and toxic.* These are called caustic alkalis. Many alkalis act as bleaches. Caustic soda-based cleaning agents are used to clear blocked drains and to clean ovens and other industrial equipment. *Ammonia is a strong grease emulsifier and should also be carefully used as it emits strong fumes.* It is also added to abrasive formulations. Toilet cleaners to which bleach has been added are very effective. *It should be kept in mind that sodium chlorite bleach should never be used with an acidic toilet cleaner, however, as it will release toxic chlorine gas.* The use of alkalis in cleaning is summarized in Table 7.8.