

What chemicals do you need for a swimming pool?

Calcium Hypochlorite(CHC), It can be used for water treatment and also as a bleaching agent. Granules or tablets are available for you.

As society becomes more and more stressed, most people will choose various ways to release stress, including the comfort of exercise-- the swimming pool is the only place.

Swimming pools also need to be disinfected and de-bacterized regularly, so **what chemicals do you need for a swimming pool?**

Chemical list: everything you need to open a swimming pool

A good test kit or test strip to check the pool's pH, calcium hardness, total alkalinity, and chlorine levels.

Chlorine pellets or tablets.

Shock treatment.

The chemicals increase or decrease alkalinity or calcium and pH.

Algae removers.

Stain treatment.

Commonly used pool disinfection methods



I. Pure chemical disinfection method

The chemical disinfectant method is usually chlorine-based disinfectants.

(1) liquid chlorine (2) [calcium hypochlorite \(bleaching powder\)](#)

(3) sodium hypochlorite (high-efficiency bleaching powder, bleaching water) (4) sodium dichloroisocyanurate (euchlorine)

(5) trichloroisocyanuric acid (strong chlorine essence) (6) bromochlorhydantoin (bromine tablets)

(7) chlorine dioxide

(1) liquid chlorine

Advantages.

It contains 100% effective chlorine, strong bactericidal power. And has a strong sustained bactericidal ability and can remove algae, deodorize and deodorize. Widely used, the technology is relatively mature, disinfection system investment and operating costs are inexpensive, commonly used in water plants disinfection.

Disadvantages.

The general dose is not effective against viruses, pathogens, etc., cannot oxidize complex compounds such as pesticides in general, and is affected by PH and reacts with certain organic substances to produce unpleasant chlorine odor. Liquid chlorine as a disinfectant also causes significant secondary pollution to humans and the environment, and the chlorine-based disinfectant itself and by-products are harmful to human health. Its use is dangerous and requires special safety equipment, and liquid chlorine should have professional safety measures during storage and transportation. When added to swimming pools, it is particularly acidic. We need to add a lot of alkalies to adjust the pH value, so liquid chlorine is rarely used in swimming pools nowadays.

(2) Bleaching powder

Advantages.

The most widely used, its main component is calcium hypochlorite $[Ca(OCl)_2]$, containing 25%-30% effective chlorine. Calcium hypochlorite is a commonly used swimming pool disinfectant. The active ingredient hypochlorite can penetrate the cells, oxidize the sulfur hydrogen genes of cell enzymes and destroy cell metabolism. It can be applied to the water of different water quality conditions with a good sterilization effect. Its bactericidal power is strong and rapid in an acidic environment, and high concentration can kill budding cells.

Disadvantages.

Unstable nature can be decomposed by light, heat, humidity, and CO_2 , so it should be stored in a dark and dry place for no more than one year. Because of its corrosion and bleaching effect, so it should not be used for metal instruments and colored textiles. If stored for too long, it should be prepared according to the actual effective chlorine content. And bleaching powder reaction residue, blocking pipes, affecting water quality, is now gradually eliminated.

(3) Sodium hypochlorite

$[NaOCl]$ alias efficient bleaching powder. Pure product is a white powder, usually gray-green crystals, unstable in the air. Sodium hypochlorite has the odor of chlorine, can be miscible with water. The solution is alkaline. The pH value of the emulsion is up to 12. With the increase of dilution of the aqueous solution, the pH value can be reduced to 7~9. It is unstable, and decomposition is accelerated when it meets heat. It has bleaching and corrosive effect on articles.

Advantages.

Its effective chlorine content is generally 10%-12%, which is less dangerous than liquid chlorine and has a good disinfection effect.

Disadvantages

The chlorine content of bleach water is very unstable, and its effective chlorine will gradually decrease with the environment, temperature, humidity, light and storage time, etc. Because its decay is particularly fast, it cannot be stored on-site for a long time and is corrosive, so it isn't easy to store and operate. There are high demands on the equipment, and routine maintenance of the equipment is difficult. Sodium hypochlorite will increase the pH of pool water extraordinarily high and needs to be adjusted by adding a large amount of acid.

(4) Sodium dichloroisocyanurate

Advantages.

Sodium dichloroisocyanurate, also known as euchlorine, molecular formula: $(C_3Cl_2N_3O_3)Na$, referred to as SDIC, is a widely used organic chlorine disinfectant, containing 60% of effective chlorine 64.5%, with the advantages of high efficiency, broad-spectrum, stability, high solubility, low toxicity. The aqueous solution can be used for spraying, soaking, wiping, also can be used for direct disinfection of pollutants, treatment of feces, and other excreta. The usage is the same as bleaching powder. When it is mixed with paraformaldehyde dry powder ignition, the gas generated after ignition can be used for fumigation disinfection. It can also be mixed with No. 92 coagulant (based on aluminum chloride plus iron powder, sulfuric acid, hydrogen peroxide, etc.) at 1:4 to form "water clear," which can be used for drinking water disinfection. And can be prepared with sodium nitrate into a variety of disinfection and washing solutions, such as polyester Jingmei, chlorine, etc. It can quickly kill viruses, bacteria, and the bud of these two and effectively prevent hepatitis and other infectious diseases.

Disadvantages

Disinfection is affected by the conditions of use. It is allergenic to eyes and skin and has an odor. It can be used as an impact treatment agent, also contains stabilizer cyanuric acid, stable under ultraviolet light, suitable for use in outdoor pools, but use in indoor pools will lead to over-stabilization problems.



(5) Trichloroisocyanuric acid

Trichloroisocyanuric acid is commonly known as strong chlorine essence; molecular formula $C_3N_3O_3Cl_3$, abbreviated as TCCA, is a chlorinated derivative of isocyanuric acid. Effective chlorine content up to 90%, mainly in the form of granules, flakes, sterilization ability is powerful.

Advantages.

TCCA is an efficient, low-toxic, broad-spectrum, rapid bactericidal disinfectant promoted internationally, which can effectively and quickly kill various bacteria, fungi, budding cells, molds, and vibrio cholera bacteria. It has

a unique effect on killing hepatitis A and B viruses and has a good disinfection effect on sex virus and HIV.

Disadvantages.

Its slow dissolution may not be able to keep up with the rate of residual chlorine consumption when the pool load is high, resulting in reduced disinfection capacity. It has a low pH and also requires a large amount of alkali for adjustment. Trichloroisocyanuric acid contains the stabilizer cyanuric acid, which is stable under UV light and suitable for outdoor pools, but its use in indoor pools can lead to over-stabilization problems. At the same time, the use of trichloroisocyanuric acid will inevitably produce harmful chlorine by-products, which is also a common disadvantage of chlorine-based chemical agents.

(6) Bromochlorhydantoin

Advantages: Bromochlorhydantoin is commonly known as bromine tablets (BCDMH), molecular formula: $C_5H_6BrClN_2O_2$, its active ingredients contain chlorine and bromine, generally crystalline powder and white pills, bromine preparations are more stable than chlorine preparations, milder odor, less sensitive to changes in pH than chlorine. Disadvantages: Bromine tablets are more expensive, and because they are slightly soluble in water, they are also slower to kill bacteria. Bromine preparations are corrosive at high doses and are a strong irritant to human skin, eyes, and cells, and under pool conditions, produce bromate, which is a known carcinogen. Because there is no suitable UV stabilizer for bromine, it is used in large amounts in outdoor swimming pools.

(7) Chlorine dioxide

The molecular formula is ClO_2 , and it is a yellow-green gas with an irritating odor and volatile. It is stable in quality at $-5\sim 95^\circ C$ and not easily decomposed.