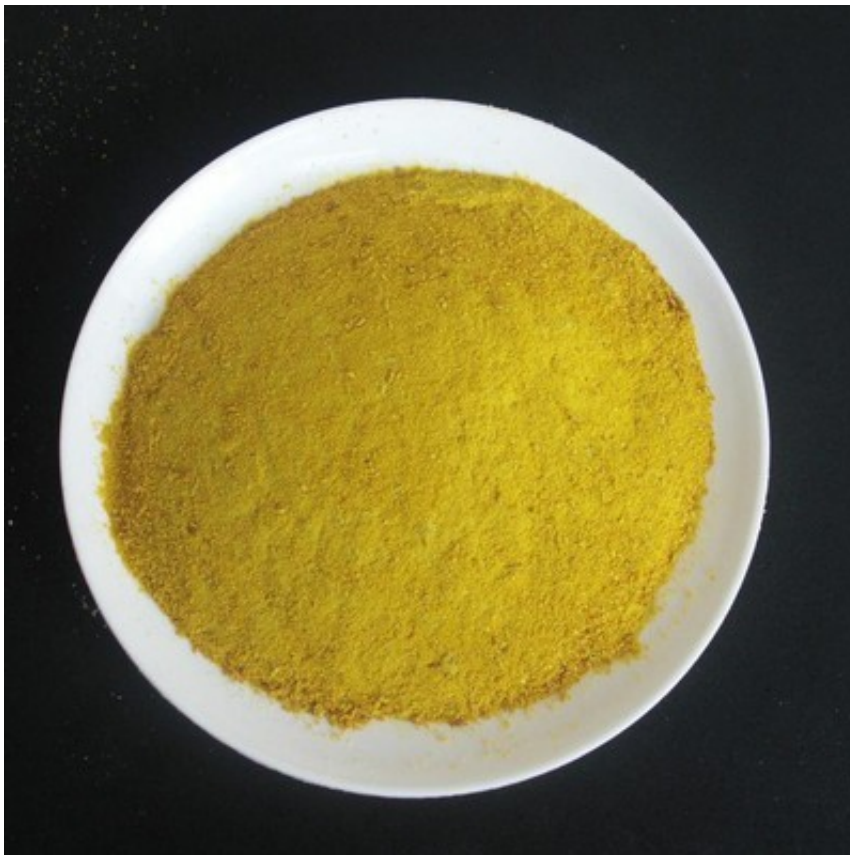


## What are the common coagulants?

**Coagulants And Flocculants smells tasteless and harmless. It can be widely used to treat source water and sewage water.**

Coagulants, sometimes called flocculants, are used in the field of wastewater treatment as a means to strengthen solid-liquid separation. It can be used to enhance the initial precipitation of sewage, flotation treatment, secondary sedimentation after the activated sludge method and can also be used for tertiary treatment or deep treatment of sewage. Organic coagulants include polymeric aluminum chloride, polymeric aluminum sulfate, polymeric ferric sulfate, polymeric ferric aluminum chloride, etc. The inorganic polymer coagulant includes polyacrylamide, which can adapt to various flocculation objects. With a small amount, high efficiency, less sludge generated, and easy post-treatment.

Coagulation treatment is usually placed in front of solid-liquid separation facilities. Combined with the separation facilities, effectively remove suspended matter and colloidal substances in raw water with a particle size of 1nm to 100 $\mu$ m, reduce the effluent turbidity and CODCr. It can be used in the pretreatment and depth treatment of the sewage treatment process and residual sludge treatment. Coagulation treatment can also effectively remove microorganisms and pathogenic bacteria in water and remove emulsified oil, color, heavy metal ions, and other sewage pollutants. Coagulation precipitation treatment of phosphorus contained in the sewage removal rate can be as high as 90 to 95%, which is the cheapest and efficient method of phosphorus removal.



So what are the common coagulants?

Commonly used metal coagulants are divided into two categories: aluminum-based and iron-based.

Aluminum coagulants include aluminum sulfate, aluminum chloride, and sodium aluminate. Iron coagulants include ferric sulfate, ferrous sulfate, ferric chloride, and ferric sulfate chloride.

### 1. [Aluminum sulfate](#)

Aluminum sulfate contains different amounts of water of crystallization,  $\text{Al}_2(\text{SO}_4)_3 \cdot n\text{H}_2\text{O}$ , where  $n=6, 10, 14, 16, 18$  and  $27$ , commonly used is  $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$  its molecular weight is  $666.41$ , specific gravity  $1.61$ , appearance is white, glossy crystals.

Aluminum sulfate is easily soluble in water, the aqueous solution is acidic, the solubility is roughly  $50\%$  at room temperature, and the pH value is below  $2.5$ . The solubility increases to more than  $90\%$  in boiling water.

### 2. Polymeric Aluminum Chloride

Polymeric aluminum chloride is an inorganic polymer coagulant.

### 3. Ferric chloride

Ferric chloride ( $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ ) is a commonly used coagulant. It is a black-brown crystalline, strongly absorbent, highly soluble in water. Its solubility increases with temperature, the formation of alum, good precipitation performance, the treatment of low-temperature water or low turbidity water better than aluminum salt. Our supply of ferric chloride has anhydrous matter, crystalline matter, and liquid. Liquid, crystalline matter, or anhydrous moisture matter is highly corrosive. Therefore, modulation and dosing equipment must be considered with corrosion-resistant equipment (stainless steel pump shaft running a few weeks that corrosion, with titanium pump shaft, has better corrosion resistance).

### 4. Ferrous sulfate

Ferrous sulfate  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$  is a translucent green crystal, easily soluble in water, with a solubility of  $21\%$  at a water temperature of  $20$ .

Ferrous sulfate dissociated  $\text{Fe}^{2+}$  can only generate simple mononuclear complexes, therefore, not as good a coagulation effect as trivalent iron salts. The  $\text{Fe}^{2+}$  remaining in the water will make the treated water with color. When the color in water is high,  $\text{Fe}^{2+}$  reacts with the colored material in the water. It will produce a darker color, not easy to precipitate the material (but can be used to remove the color of trivalent iron salt). According to the above, ferrous sulfate should be oxidized to trivalent iron when using it, and then the coagulation effect.

### 5. magnesium carbonate

Aluminum salt and iron salt added to the water as a coagulant will form a floc with the impurities in the water to precipitate at the bottom of the pool. As sludge, it should be treated appropriately to avoid pollution. Large water plants produce a large amount of sludge, so many people have tried to use sulfuric acid to recover the effective aluminum and iron in the sludge. However, the recovered material often has many iron, manganese,

and organic colors, so it is unsuitable for coagulants.



#### 6. Organic synthetic polymer coagulant

Polymer coagulants are generally linear polymers. Their molecules are chain-like and composed of many links; each link is a chemical monomer, the monomer to covalent bonding. The molecular weight of the polymer is the sum of the molecular weight of the monomers. The total number of monomers is called the degree of polymerization, while the polymerization degree of polymer coagulant means the number of links, about from 1000 to 5000. the low polymerization degree of molecular weight from 1000 to tens of thousands, the high polymerization degree of molecular weight from several thousand to several million, polymer coagulant dissolved in water will generate a large number of the linear polymer.