

## Multi Functional High Polymer Flocculant

### PG $\alpha$ 21Ca

PG $\alpha$ 21Ca is a kind of flocculants that has both organic and inorganic characteristics of flocculants. It is made of organic cross-linked polyglutamic acid and inorganic substances like calcium compounds. Compared to other flocculants, it has multi-functional effects, so it can be used for purification of various types of contaminated and waste water.

#### ● Special Features

- Fast formation of flocs and their fast precipitation (compared to our other products).
- Can be used for a wide range of pH(4-12) of water.
- Small changes in pH compared to other flocculants.
- Safety has been confirmed by several examinations at the institutions recognized by environment ministry.
- Can effectively remove heavy metals in water.
- Can reduce cost of sludge treatment since proportion of water in flocs is quite low.
- Can be used together with other flocculants, such as PAC.

#### ● Safety Test

Evaluation test as medicine for use in city water ( Japan Food Analysis Center )

Item	Result
Aluminum and its compounds	Within range
Cadmium and its compounds	Within range

Safety Test ( Tanabe R&D Services )

Test Name	Item	Result
Poison Test by giving oral dosage to both male and female mouse.	LD <sub>50</sub> (mg/kg)	> 2,000
Mutation Test by using microbe (Ames test)	Genetic Mutation	No induction

Water Poison Test (Center for Safety Evaluation of Agro medicine used in food)

Test name	Item	Result
Acute toxicity test of killifish	LC <sub>50</sub> (mg/L)	> 10,000

※ MSDS (Material safety data sheet ) is provided separately.



PG  $\alpha$  21Ca (20kg)

Flocculants can separate water from dirt by flocculating dirty substances of filthy water.

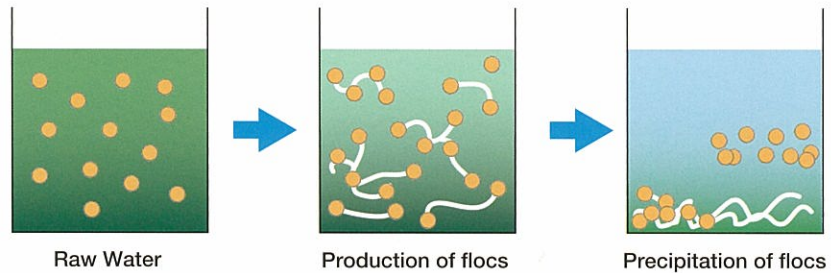


### What is flocculant?

Flocculant is a kind of medicine used to flocculate minute particles that cause filthiness dispersed in water and, to facilitate settling or floating of flocculated particles. The aggregate of minute particles is called floc. Clear water can be obtained by separating water from solid flocs.

In filthy water, large number of minute particles floats dispersedly. The small particles always remain dispersed because they are charged negatively and they repulse each other.

### ● Flocculation Process



When PG $\alpha$ 21Ca is added to water, flocs are formed for its two functions.

#### Function of inorganic ingredients

Inorganic ingredients of PG  $\alpha$ 21Ca neutralize the function of negative charging and inactivate repulsing power among particles and finally condense the particles.

#### Function of Polyglutamic Acid (Anion polymer)

Polyglutamic acid with its function of carboxyl group (active group) works like glue that forms bridges among small particles.

Turbidity of water gets improved when contaminated particles form flocs and the flocs settle in the bottom or float on the top of water.

**PG $\alpha$ 21Ca can treat all kinds of contaminated water.**