

Success in Developing a New Flocculant

PG-M is a flocculant of magnetic body while its main ingredient is polyglutamic acid (biodegradable polymer). Differing from conventional flocculants, magnetic substances are added to flocculants so that the flocs (flocc is a solid form of flocculated suspended particles in water), can be collected by gravitation of magnetic power.

● Appearance

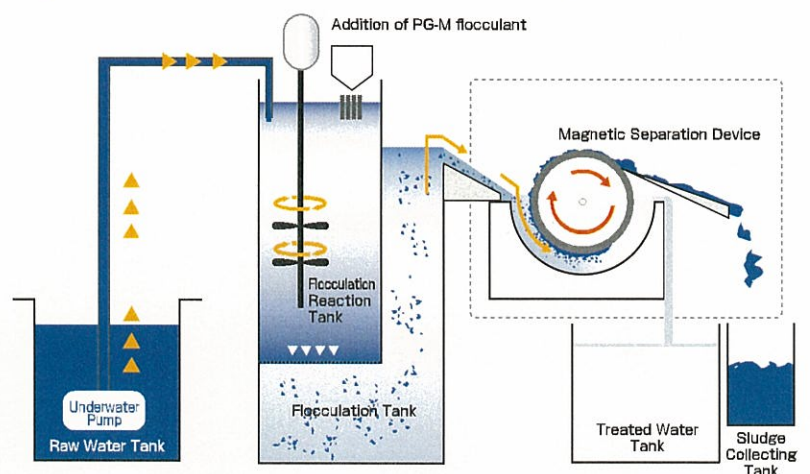
Grayish Black Powder

● Characteristics

- Can gravitate and collect flocs with magnetic power.
- Safety has been confirmed by several examinations at the institutions recognized by environment ministry.
- It can be used in both sweet and salty water
- Its preservation, transportation and handling is easy since it is in powder form.

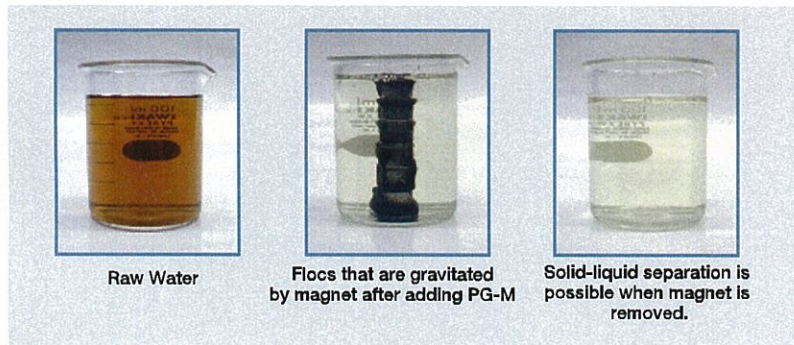
※ It requires enough stirring before use since it contains hydrophobic property in part. Some flocculants may remain since some of the ingredients which are used to improve flocculation effect, are inorganic.

● Flow Diagram of Magnetic Separation System



※ Both electric and permanent magnets are available.

PG-M Treatment



● Comparison with Conventional Construction Method (PAC + Polyacrylamide)

Item		Conventional Method	PG-M	Remark	
Basic Physicality	Shape	Water body	Powder	Quality control of PG-M is easy since it is in powder form	
	Floc	Formation	Slow	Fast	
		Settling speed	Slow	Fast	
		Size	Small	Large	
		Hardness	n/a	Hard	
	pH adjustment	Need	No need (pH3~12)	PG-M can be used in a wide range of pH and it hardly causes any changes to pH.	
Danger of ingredients	High	Low	PG-M is made from natural ingredient 'polyglutamic acid'. PAC and acrylamide monomer may cause Alzheimer disease and nerve toxin respectively. (*Safety has been confirmed by Ames, dosage and acute toxicity tests.)		
Industry waste water	Facility	Structure	Complex	Easy	A small scale and simple structure is enough as flocculation, settling and separation can be conducted in the same tank by using PG-M. Moreover, maintenance is also quite easy.
		Scale	Large	Small	
		Maintenance	Complex	Easy	
	Heavy metal Removal	Impossible	Possible	PG-M can remove iron, hexavalent chrome and arsenic.	
Proportion of Water in floc	High	Low	PG-M has good dewaterability.		
Natural River, pond swamp	Environmental burden	High	Low	PG-M causes little change in pH and minimum affect on livings in water.	
	Affect on livings in water	High	Low		

Safety Test (Tanabe R&D Service)

Test Name	Item	Result
Acute toxicity test by giving oral dosage to mice	LD ₅₀ (mg/kg)	> 2,000

Aquatic Toxicity Test (Food and Agro-medicine Safe Evaluation Center)

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