

6

PERFORMANCE CHEMICALS FOR WASTEWATER TREATMENT

- 1. Polymer Flocculants**
- 2. Aminoalkyl Methacrylate Monomers**

IMPORTANT :

Before handling these products, refer to the current Safety Data Sheet for recommended protective equipment, and detailed precautionary and hazards information.

SANYO CHEMICAL PRODUCT OUTLINE

1. Polymer Flocculants

SANFLOC products are agents that are essential for wastewater treatment. These products are water-soluble polymers and are offered in a wide range of molecular weights from a few million to twenty million with a lot of absorptive functional groups in their molecules. Therefore, these products promote separation and dewatering of wastewater by flocculating fine suspended solids floating in wastewater and forming big floc particles.

1-1. Typical Properties

Product Name	Appearance (20 ± 5 °C)	Ionicity	Cationic Charge Density *	Anionic Charge Density *	pH Range for Effective Use	Features	Main Applications
SANFLOC CH-019P	White powder	Cationic	100	–	3 – 10	Effective in dewatering when belt press filters are used.	Dewatering of sludge: promoting dewatering organic sludge generated from treatment of municipal wastewater (sewage and night soil, etc.)
SANFLOC C-009P				–			
SANFLOC R-339P	White powder	Amphoteric	30	35	3 – 7	Effective in dewatering when inorganic flocculant is used together.	Dewatering of sludge: promoting dewatering organic sludge generated from treatment of municipal wastewater (sewage and night soil, etc.)
SANFLOC R-337P				35			
SANFLOC AH-400P	White powder	Anionic	–	40	7 – 12	Can be also used for flocculation and sedimentation process.	Flocculation and sedimentation treatments: promoting sedimentation, filtration and clarification of industrial wastewater
SANFLOC AH-330P			–	30			
SANFLOC AH-200P			–	20	6 – 12		
SANFLOC AS-110P			–	10			
SANFLOC AS-510P			–	5	5 – 12		
SANFLOC NOP	White powder	Nonionic	–	–	3 – 10	Effective for acidic wastewater.	Flocculation and sedimentation treatments: promoting sedimentation, filtration and clarification of industrial wastewater
SANFLOC N-500P			–	–			
SANFLOC N-520P			–	4			

* Calculation value

Note: The values described in this brochure are all representative.

1-2. Aqueous Solution Viscosity, Standard Concentration and Amount to be Used

Product Name	Viscosity of Aqueous Solution mPa · s (30°C)				Standard Concentration (wt %)	Standard Amount ppm	
	0.1 wt %	0.2 wt %	0.3 wt %	0.5 wt %		Flocculation and Sedimentation	Dewatering of Sludge
SANFLOC CH-019P	70	200	360	760	0.02 – 0.4	1 – 100	50 – 1,000
SANFLOC C-009P	80	160	380	820			
SANFLOC R-339P	70	200	380	850	0.02 – 0.4	1 – 100	50 – 1,000
SANFLOC R-337P	70	200	380	850			
SANFLOC AH-400P	250	700	1,250	2,600	0.02 – 0.2	0.1 – 50	10 – 100
SANFLOC AH-330P	220	600	1,100	2,400			
SANFLOC AH-200P	200	550	1,000	2,200			
SANFLOC AS-110P	120	350	650	1,500			
SANFLOC AS-510P	70	230	460	1,100			
SANFLOC NOP	60	170	300	650	0.02 – 0.2	0.1 – 50	10 – 100
SANFLOC N-500P	20	80	180	500			
SANFLOC N-520P	40	140	280	700			

1-3. Examples of Applications

Applications		Ionicity of Polymer Flocculant		Anionic			Nonionic
		Cationic SANFLOC CH-019P, C-009P	Amphoteric SANFLOC R-339P, R-337P	SANFLOC AH-400P, AH-330P	SANFLOC AH-200P	SANFLOC AS-110P, AS-510P	SANFLOC NOP, N-500P, N-520P
Sewage and night soil	Dewatering of activated sludge	A	A	–	–	–	–
	Flocculation and sedimentation treatment for activated sludge	B	B	–	–	–	–
Pulp and paper	Flocculation and sedimentation treatment for pulp and papermaking wastewater	–	–	–	A	A	A
	Dewatering of activated sludge	B	B	–	–	–	–
	Recovery of waste fibers in white water	–	–	–	A	A	A
Mining	Flocculation and sedimentation treatment for mineral deposits and mineral wastewater	–	–	A	A	A	A
	Flocculation and sedimentation treatment for limestone cleaning wastewater	–	–	A	A	B	–
Machinery and metal	Flocculation and sedimentation treatment for metal smelting and wastewater	–	–	B	A	A	A
	Flocculation and sedimentation treatment for wastewater in the plating industry	–	–	B	A	A	A
Construction	Treatment for ballast and quarrying wastewater	–	–	A	A	A	A
	Treatment for dredging wastewater	–	–	A	A	A	–
Ceramics	Treatment for cement and ready-mixed concrete manufacturing wastewater	–	–	B	A	B	B
	Treatment for clay and kaolin clay wastewater	–	–	B	A	A	B
Textiles and dyeing	Flocculation and sedimentation treatment for textile manufacturing wastewater	–	–	B	A	A	A
	Flocculation and sedimentation treatment for wool-dyeing wastewater	–	–	B	A	A	A
	Dewatering of activated sludge	A	A	–	–	–	–
Food	Flocculation and sedimentation treatment for fish and meat wastewater	–	–	B	A	A	B
	Flocculation and sedimentation treatment for rice washing water and starch manufacturing wastewater	–	–	B	A	A	B
	Dewatering of activated sludge	A	A	–	–	–	–
Chemicals	Flocculation and sedimentation treatment for wastewater in the paint industry	–	–	B	A	A	A
	Recovery of magnesium hydroxide	–	–	–	A	B	–
	Dewatering of activated sludge	A	A	–	–	–	–

Note: A, Most commonly effective; B, Commonly effective

2. Aminoalkyl Methacrylate Monomers

METHACRYLATE products are aminoalkyl methacrylate monomers having double bonds, and either tertiary amino groups or quaternary ammonium groups in their molecules. These products are used as raw materials for polymer flocculants.

2-1. Chemical Name and Structural Formula

Product Name	Chemical Name	Structural Formula	MEHQ* Content (ppm)
METHACRYLATE DMA	2-(Dimethylamino) ethyl methacrylate		1,000
METHACRYLATE DMC-80	Methacryloyl oxyethyl trimethyl ammonium chloride		2,000
METHACRYLATE DMB-60	Methacryloyl oxyethyl dimethylbenzyl ammonium chloride		290

* Hydroquinone monomethyl ether (radical polymerization inhibitor)

2-2. Physical Properties

	Appearance	Color (APHA)	Purity (wt %)	Water Content (wt %)	pH	Molecular Weight	Specific Gravity (20°C/4°C)
METHACRYLATE DMA	Colorless liquid	10	99.8	0.2	-	157	0.935
METHACRYLATE DMC-80	Colorless liquid	30	78.5	21.5	6.0	207.5	1.113
METHACRYLATE DMB-60	Pale yellow liquid	30	59.0	41.0	8.0	283.5	1.088

2-3-1. Chemical Properties (Q and e Values)

	Q value	e value
METHACRYLATE DMA	0.68	0.48
METHACRYLATE DMC-80	1.49	0.27

2-3-2. Chemical Properties (Copolymerization Reactivity Ratio)

Monomer 1	Monomer 2	r1	r2
METHACRYLATE DMA	Styrene	0.37	0.53
	Vinyl acetate	15.6	0.035
	n-Butyl acrylate	1.61	0.61
	2-Ethylhexyl acrylate	1.59	0.63
	Methyl methacrylate	0.88	1.12
	Vinyl chloride	29.7	0.03
METHACRYLATE DMC-80	Acrylamide	1.71	0.25

2-4. Examples of Applications

Polymers obtained by homopolymerization or copolymerization with other vinyl monomers have water solubility, hydrophilic and antistatic properties, conductivity, and an adsorptive property and reactivity for anionic compounds. Therefore, METHACRYLATE products are suitable as polymer modifiers to impart such properties and are particularly used as raw materials for polymer flocculants, electro-dialysis, reverse osmosis membranes, ion-exchange resins, paper strength additives, and drainage/retention aids used in paper making processes.

PRODUCT LIST

1 PERFORMANCE CHEMICALS FOR SYNTHETIC RESIN & RUBBER INDUSTRIES AND PAINT, INK & PIGMENT INDUSTRIES

1. Emulsifiers for Emulsion Polymerization
2. Pigment Dispersants (Oligomer Type)
3. Resin Modifiers
4. Antistatic Agents
5. Mold Releasing Agents
6. Printing Ink Binders
7. Compounding Ingredients for Paints and Printing Inks
8. Pigment Dispersants (Surfactant Type)
9. Defoaming Agents
10. Plasticizers for Polyurethane-Based Sealants

2 PERFORMANCE CHEMICALS FOR COSMETICS, PHARMACEUTICALS, AGRICHEMICALS AND DETERGENTS

Performance Chemicals for Cosmetics

1. Base Materials for Shampoos (Anionic Type)
2. Base Materials for Shampoos (Amphoteric Type)
3. Foam Stabilizers and Thickeners for Shampoos
4. Base Materials for Body Washes
5. Base Materials for Hair Conditioners
6. Compounding Ingredients for Cosmetics
7. Emulsifiers for Cosmetics
8. Gelling Agents for Cosmetics

Performance Chemicals for Pharmaceuticals

1. Tablet Binders
2. Base Materials for Ointments
3. Coating Agents for Tablets
4. Germicides (Pharmaceutical Use)
5. Other Products for Pharmaceuticals

Performance Chemicals for Agrichemicals

1. Dispersants for Agrichemical Granule Preparations

Performance Chemicals for Detergents

1. Base Materials for Detergents
2. Germicides (Industrial Use)
3. Additives for Detergents
4. Base Materials for Household Fabric Softeners
5. Industrial Defoaming Agents

3 PERFORMANCE CHEMICALS FOR POLYURETHANE AND POLYURETHANE-RELATED INDUSTRIES

1. Polyether Polyols for Flexible Slabstock Polyurethane Foams
2. Polyether Polyols for Automobile Hot Molded Seat Cushions
3. Polyether Polyols for Automobile High-Resilient Molded Seat Cushions
4. Polyether Polyols for Crushpad Foams
5. Polyether Polyols for Rigid Polyurethane Foams
6. Multi Functional Polyols
7. Example of Polyurethane Foam System
8. Polyether Polyols for CASE
9. Prepolymers and Raw Materials for Polyurethane Elastomers
10. Base Materials for Synthetic Leathers
11. Water-Borne Polyurethanes for Textile Processing
12. Polyurethane Emulsions for Coatings

4 PERFORMANCE CHEMICALS FOR LUBRICANT INDUSTRIES AND MACHINERY & METAL PROCESSING INDUSTRIES

1. Lubricant Additives
2. Base Materials for Polyalkylene Glycol-Type Lubricants
3. Base Materials for Water-Soluble Quenchants
4. Base Materials for Hydraulic Fluids
5. Materials for Brake Fluids
6. Rust Inhibitors
7. Water-Soluble Cutting Fluids
8. Emulsifiers for Metal Working Oils
9. Base Materials for Metal Cleaners

5 PERFORMANCE CHEMICALS FOR RESOURCE EXTRACTION AND MINING INDUSTRIES

1. Polymer Flocculants
2. Dewatering Accelerator
3. Cold Flow Improvers
4. Lubricity Improver
5. Dewaxing Aids

6 PERFORMANCE CHEMICALS FOR WASTEWATER TREATMENT

1. Polymer Flocculants
2. Aminoalkyl Methacrylate Monomers

7 PERFORMANCE CHEMICALS FOR COSMETICS SUCH AS HAIR-CARE, SKIN-CARE AND MAKE-UP

1. Foaming Agents/Detergents/Foam Improvers
2. Emulsifying Agent/Solubilizing Agent/Dispersing Agent
3. Conditioning Agents/Styling Agents
4. Thickeners/Gelling Agents/Film-Forming Agents
5. Moisturizing Agents/Moistening Agents
6. Antibacterial/Anticeptic

8 PERFORMANCE CHEMICALS FOR CONSTRUCTION AND PUBLIC WORKS

1. Flooring Materials
2. Polyurethane for Architectural Paints
3. Water Sealants
4. Waterproofing Agents
5. Concrete Admixtures
6. Dispersant for Manufacturing Cement Boards by Extrusion Molding
7. Foaming Agent for Foam Concrete
8. Agents for Drilling Mud
9. Waste Mud Solidification
10. Polymer Flocculants for Gravel Washing Wastewater Treatment
11. Binder for Ceramics

9 ADHESIVES AND ADHESIVE-RELATED PRODUCTS

1. Pressure-Sensitive Adhesives (Cohesive Agents)
2. Potting Resins for Artificial Kidneys (Hollow-Fiber Type)
3. Resins for Anti-Corrosion Paints for Automobiles
(for Improving Adhesion of Paints to Electrodeposition Steel)
4. Binders for Fiber-Finishing Agents
5. Binders for Fiberglass
6. Curing Agents for Epoxy Resins

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