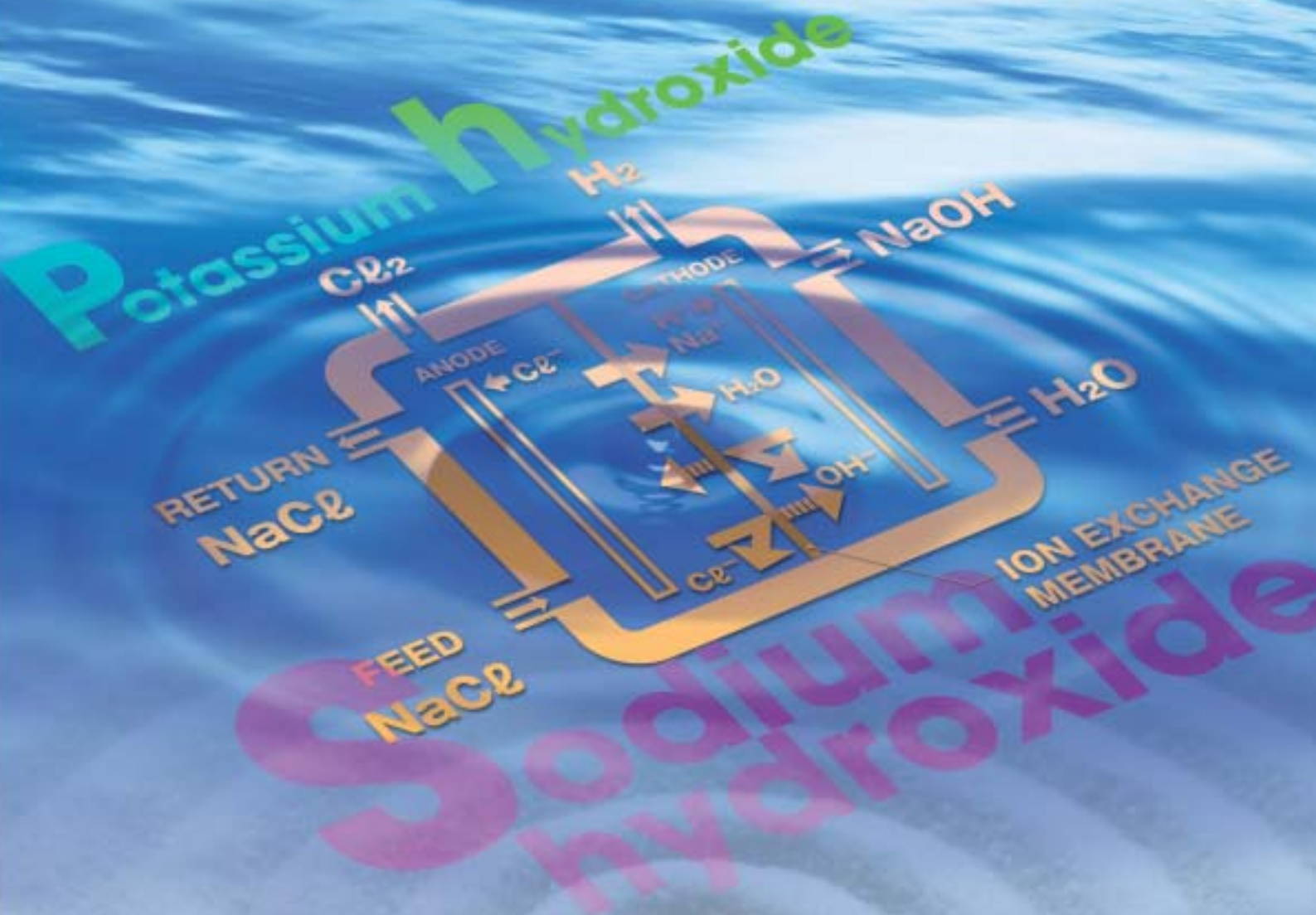


High Purity Alkali Products



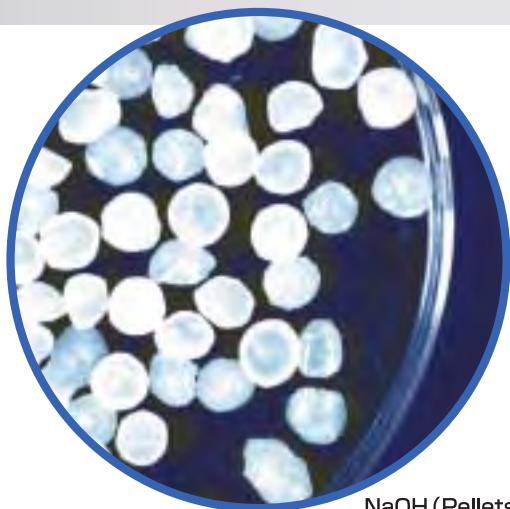
Kanto Reagents



Kanto Kagaku

Wide product range covering from multipurpose to super pure grade manufactured by independently developed unique alkali pelletizer

Kanto Chemical's advanced manufacturing lines for alkali products have enabled us to supply high purity pellet type NaOH and KOH worldwide. This unique pelletizer is only one equipment applicable to mass production in Japan, which is operated through certified manufacturing technologies and strict quality control. In addition, we have been paying great attention to being free from such heavy metals as mercury. To achieve this objective, we purify alkali solution for raw material by electrolysis technique equipped with ion exchange membrane. We have lined up wide variety of products, such as guaranteed and extra pure grade reagent, high purity products, pellets and liquid to fully meet our customers' requirements.



NaOH (Pellets)
(ca Φ :5~7mm)

● Features of pellet type alkali products

The fragile flaked type alkali product is likely to generate powder and it solidifies when absorb moisture due to its large contact area. While small contact area of our pellet type of alkali reagent leads to low hygroscopicity, large apparent specific gravity and not bulky. These palletized products are much superior to the flaked type for handling.

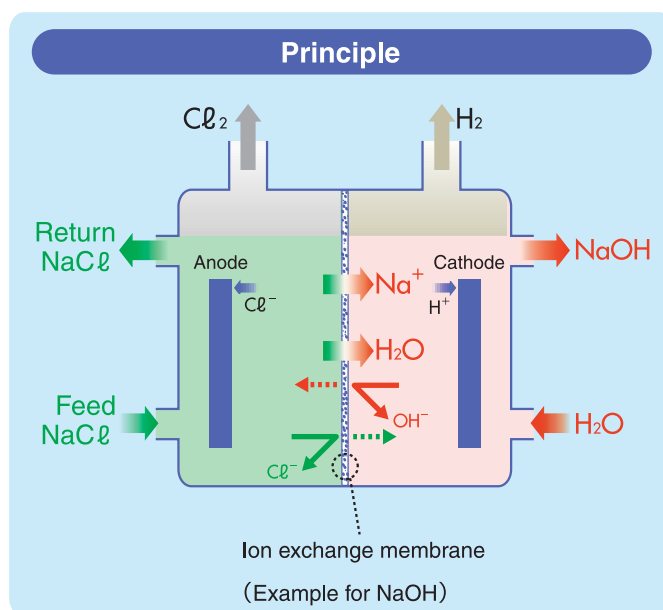
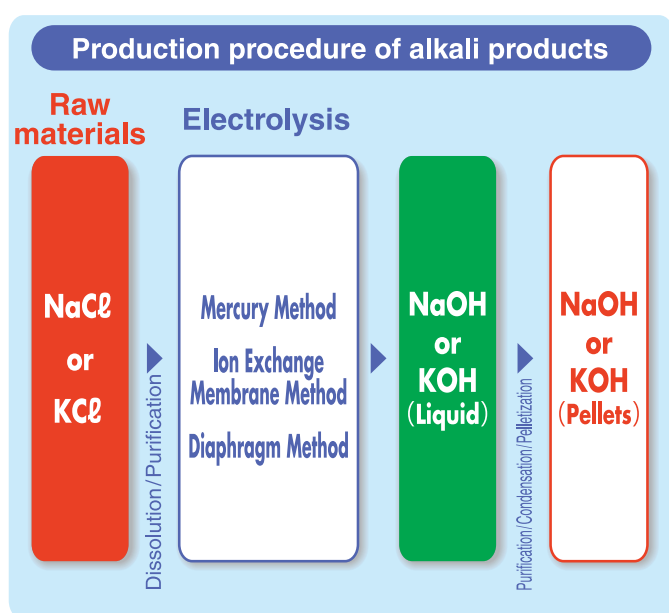
Employing alkali solution made by Ion Exchange Membrane Method (No mercury is included in production process)

● Production procedure of alkali products

KOH and NaOH are produced by electrolysis of NaCl and KCl respectively. There are mercury method, diaphragm method and ion exchange membrane method for alkali production, but taking the opportunity of outbreak of Minamata disease, the mercury method was abolished in Japan in 1987, then the production procedure is being replaced with diaphragm or ion exchange membrane method.

In Europe the mercury method still exists widely and diaphragm method is dominant in the USA. In mercury method the reaction proceeds by way of amalgam consisted of alkali metals and mercury, therefore, mercury is demanded for the production process.

We just use alkali solution made by ion exchange membrane method for raw material to completely prevent mercury from coming in the process.



Quality Control

Our NaOH and KOH are analyzed by each lot with modern analytical devices. Product quality is strictly controlled by atomic absorption spectrophotometer, ICP-AES and ICP-MS.

All of our five plants were certified for ISO9001 and ISO14001 in 1997 taking the lead in the reagent industry. We are going to install new production line for GMP and start to supply the product to the pharmaceutical field in the spring of 2006.



Product Line

Super pure KOH (Pellets) (for precise analysis, UGR)

The highest quality KOH is produced by condensation and pelletization of KOH solution obtained from electrolysis of highly purified KCl. Metal impurities are extremely reduced, and especially Na contamination is guaranteed to be less than 20 ppm. These products are widely used in the semiconductor industry as an analytical reagent to measure ultra minute amount.

Super pure NaOH (Pellets) (for precise analysis, UGR) Available soon

This is super pure NaOH of which metal impurities are reduced to the lowest concentration. Especially, ppt-level concentration has been achieved for Fe, Cu, Al and Ca. This is suitable for an analytical reagent to measure ultra minute amount for the semiconductor processing.

Ultrapur KOH / NaOH (Liquid) (3mol/L)

This is an ultra pure alkali product which guarantees ppt level metal impurities and suitable for the trace analysis. A dedicated bottle is applied to minimize contaminants from containers. A clean room or clean bench is needed when handling.

Guaranteed and extra pure grade KOH / NaOH (Pellets)

This is the standard in pellet type alkali products. Guaranteed grade products accorded with JIS and extra pure grade products are very common for research use.

Electronics industry use Ultrapur KOH (Liquid) KOHLM and KOHULM

Reviewing conventional raw materials, components for the manufacturing process and purification procedures, Kanto Chemical has achieved substantial reduction for metal impurities and particles in KOH solution. Moreover, we can supply KOH ULM in which Na is further limited.

Electronics industry use KOH / NaOH (Liquid) (special grade solution)

Reviewing conventional raw material, metals impurities are extremely reduced in alkali solution. This product is used as reagent for electronics industries.

Food additives KOH / NaOH (Pellets)

This grade product is applicable to food processing.

Japan Pharmacopoeia KOH / NaOH (Pellets)

We have launched KOH and NaOH of which application is regulated only for pharmaceutical research and development and actual production.

KOH (Liquid)

Grade	Ultrapur (3mol/l)	Guaranteed grade (48 %)	Extra pure grade (48 %)	for Electronics industry (48% KOHULM)	for Electronics industry (48% KOHLM)	for Electronics industry (48% special grade)	for Electronics industry (20% special grade)
Concentration	min. 15.0%	47.0-49.0%	47.0-49.0%	47.5-49.5%	47.0-49.0%	47.0-49.0%	19.0-21.0%
Color (Hazen)	max. 10						
Chloride (Cl)	//	0.001%	0.005%	5ppm	5ppm	10ppm	10ppm
Nitrate (NO ₃)	//			5ppm	5ppm	5ppm	5ppm
Phosphate (PO ₄)	//	5ppm		1ppm	1ppm	5ppm	5ppm
Silicate (SiO ₂)	//	0.004%	0.02%				
Sulfate (SO ₄)	//	5ppm	0.003%	5ppm	5ppm	5ppm	5ppm
Nitrogen compounds (N)	//	5ppm	0.001%				
Sodium (Na)	//	0.5%	0.5%	10ppm	100ppm	1000ppm	500ppm
Copper (Cu)	//	3ppb		20ppb	20ppb	200ppb	100ppb
Magnesium (Mg)	//	1ppb	3ppm	20ppb	20ppb	100ppb	100ppb
Calcium (Ca)	//	2ppb	0.001%	100ppb	100ppb	500ppb	300ppb
Strontium (Sr)	//	1ppb					
Barium (Ba)	//	10ppb					
Zinc (Zn)	//	15ppb	5ppm	20ppb	20ppb	100ppb	50ppb
Cadmium (Cd)	//	1ppb					
Aluminium (Al)	//	30ppb	0.001%	50ppb	50ppb	300ppb	200ppb
Silicon (Si)	//						
Lead (Pb)	//	2ppb	3ppm	20ppb	20ppb	100ppb	50ppb
Arsenic (As)	//	3ppb					
Chromium (Cr)	//			50ppb	50ppb	300ppb	200ppb
Iron (Fe)	//	10ppb	3ppm	100ppb	100ppb	500ppb	300ppb
Nickel (Ni)	//		5ppm	20ppb	20ppb	200ppb	100ppb
Ammonium (NH ₄)	//			3ppm	3ppm	5ppm	5ppm
Potassium Carbonate (K ₂ CO ₃)	//	0.5%	1.0%	0.2%	0.2%	0.5%	0.5%
Particle (>0.5μm)	//			100 pieces/ml	100 pieces/ml		

※Different concentration of KOH for electronics industry will be prepared according to customers' requests.

KOH (Pellets)

Grade	for Precise analysis UGR	Guaranteed grade	Extra pure grade
Purity	min. 86.0%	min. 86.0%	min. 85.5%
Solubility in water	to pass test	to pass test	to pass test
Chloride (Cl)	max. 0.002%	0.002%	0.003%
Phosphate (PO ₄)	// 5ppm	5 ppm	
Silicate (SiO ₂)	// 0.002%	0.002%	0.01%
Sulfate (SO ₄)	// 0.001%	0.001%	0.002%
Nitrogen compounds (N)	// 5ppm	5ppm	0.001%
Lithium (Li)	// 0.05ppm		
Sodium (Na)	// 20ppm	0.3%	1.0%
Copper (Cu)	// 0.05ppm		
Silver (Ag)	// 2ppm		
Magnesium (Mg)	// 0.05ppm	5ppm	
Calcium (Ca)	// 0.2ppm	0.001%	
Zinc (Zn)	// 0.5ppm	0.001%	
Cadmium (Cd)	// 0.05ppm		
Mercury (Hg)	// 0.05ppm		
Aluminium (Al)	// 0.2ppm	0.001%	0.002%
Gallium (Ga)	// 0.5ppm		
Lead (Pb)	// 0.05ppm	5ppm	0.001%
Bismuth (Bi)	// 0.05ppm		
Chromium (Cr)	// 0.3ppm		
Manganese (Mn)	// 0.05ppm		
Iron (Fe)	// 1ppm	1ppm	5ppm
Nickel (Ni)	// 0.05ppm	0.001%	
Potassium Carbonate (K ₂ CO ₃)	// 1.5%	1.0%	1.5%

Standard for Japan Pharmacopoeia

Grade	KOH (Pellets)
Purity	min.85.0%
Appearance	to pass test
Identification (1)	to pass test
Identification (2)	to pass test
Solubility in water	to pass test
Sodium (Na)	to pass test
Chloride (Cl)	max. 0.050%
Heavy metal (as Pb)	// 30ppm
Potassium Carbonate (K ₂ CO ₃)	// 2.0%

Standard for food additives

Grade	KOH (Pellets)
Purity	min.85.0%
Appearance	to pass test
Identification (1)	to pass test
Identification (2)	to pass test
Solubility in water	to pass test
Sodium (Na)	to pass test
Chloride (Cl)	max. 0.050%
Heavy metal (as Pb)	// 15μg/g
Mercury (Hg)	// 0.1μg/g
Lead (Pb)	// 5μg/g
Arsenic (as As ₂ O ₃)	// 2.0μg/g
Potassium Carbonate (K ₂ CO ₃)	// 1.75%

NaOH (Liquid)

Grade	Ultrapur (3mol/l)	Guaranteed grade	Extra pure grade	for Electronics Industry (48% Special grade)	for Electronics Industry (20% Special grade)
Concentration	min. 11.0%	48.0-50.0%	48.0-50.0%	47.0-49.0%	19.0-21.0%
Color (Hazen)	max. 10				
Chloride (Cl)	//	0.002%	0.005%	20ppm	20ppm
Nitrate (NO ₃)	//			20ppm	20ppm
Phosphate (PO ₄)	//	5ppm		5ppm	5ppm
Sulfate (SO ₄)	//	0.001%	0.003%	10ppm	10ppm
Silicate (SiO ₂)	//	0.005%	0.02%		
Nitrogen compounds (N)	//	5ppm	0.001%		
Potassium (K)	//	0.1%	0.2%	500ppm	300ppm
Copper (Cu)	//	3ppb		200ppb	100ppb
Magnesium (Mg)	//	1ppb	2ppm	500ppb	300ppb
Calcium (Ca)	//	2ppb	0.001%	500ppb	300ppb
Strontium (Sr)	//	1ppb			
Barium (Ba)	//	10ppb			
Zinc (Zn)	//	10ppb	5ppm	300ppb	200ppb
Cadmium (Cd)	//	1ppb			
Aluminium (Al)	//	20ppb	0.001%	300ppb	200ppb
Silicon (Si)	//			20ppm	10ppm
Lead (Pb)	//	2ppb	2ppm	300ppb	200ppb
Arsenic (As)	//	3ppb			
Chromium (Cr)	//			500ppb	300ppb
Iron (Fe)	//	10ppb	2ppm	500ppb	300ppb
Nickel (Ni)	//		5ppm	300ppb	200ppb
Ammonium (NH ₄)	//			20ppm	20ppm
Sodium Carbonate (Na ₂ CO ₃)	//	0.5%	1.0%	0.5%	0.5%

※Different concentration of NaOH for electronics industry will be prepared according to customers' requests.

NaOH (Pellets)

Grade	Guaranteed grade	Extra pure grade
Purity	min. 97.0%	min. 95.0%
Solubility in water	to pass test	to pass test
Chloride (Cl)	max. 0.001%	0.007%
Phosphate (PO ₄)	// 5ppm	
Sulfate (SO ₄)	// 0.001%	0.002%
Silicate (SiO ₂)	// 0.002%	0.01%
Nitrogen compounds (N)	// 5ppm	0.001%
Potassium (K)	// 0.05%	0.1%
Magnesium (Mg)	// 5ppm	
Calcium (Ca)	// 0.002%	
Zinc (Zn)	// 0.001%	
Aluminium (Al)	// 0.002%	0.003%
Lead (Pb)	// 5ppm	0.001%
Iron (Fe)	// 5ppm	5ppm
Nickel (Ni)	// 0.001%	
Sodium Carbonate (Na ₂ CO ₃)	// 1.0%	1.5%

Standard for Japan Pharmacopoeia

Grade	NaOH (Pellets)
Purity	min.95.0%
Appearance	to pass test
Identification (1)	to pass test
Identification (2)	to pass test
Solubility in water	to pass test
Potassium (K)	to pass test
Mercury (Hg)	to pass test
Chloride (Cl)	max. 0.050%
Heavy metal (as Pb)	// 30ppm
Sodium Carbonate (Na ₂ CO ₃)	// 2.0%

Standard for food additives

Grade	NaOH (Pellets)
Purity	min.95.0%
Appearance	to pass test
Identification (1)	to pass test
Identification (2)	to pass test
Solubility in water	to pass test
Heavy metal (as Pb)	max. 30μg/g
Mercury (Hg)	// 0.10μg/g
Arsenic (as As ₂ O ₃)	// 4.0μg/g
Sodium Carbonate (Na ₂ CO ₃)	// 2.0%

● Product list and containers

■ KOH (Liquid)

	Cat. No.	Package	Container
Ultrapur (3mol/l)	32947-1B	250ml	③
Guaranteed grade (48%)	32938-80	25kg	⑤
Extra pure grade (48%)	32938-81	25kg	⑤
for Electronics Industry (48% KOHULM)	—	5kg 25kg 280kg	④ ⑤ ⑥
for Electronics Industry (48% KOHLM)	—	5kg 25kg 280kg	④ ⑤ ⑥
for Electronics Industry (48% special grade)	—	5kg 25kg 280kg	④ ⑤ ⑥



■ KOH (Pellets)

	Cat. No.	Package	Container
for precise analysis (UGR)	32348-08	500g	①
Guaranteed grade	32344-00	500g	①
Guaranteed grade	32344-80	20kg	②
Extra pure grade	32344-01	500g	①
Extra pure grade	32344-81	20kg	②



■ NaOH (Liquid)

	Cat. No.	Package	Container
Ultrapur (3mol/l)	37960-1B	250ml	③
Guaranteed grade (48%—50%)	37959-80	20L	⑤
Extra pure grade (48%—50%)	37959-81	20L	⑤
for Electronics Industry (48% special grade)	—	5kg	④
for Electronics Industry (48% special grade)	—	25kg	⑤
for Electronics Industry (48% special grade)	—	280kg	⑥



■ NaOH (Pellets)

	Cat. No.	Package	Container
for precise analysis (UGR)	37184-03	500g	①
Guaranteed grade	37184-00	500g	①
Guaranteed grade	37184-80	20kg	②
Extra pure grade	37184-01	500g	①
Extra pure grade	37184-81	20kg	②





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