



SUMITOMO CHEMICAL

Creative Hybrid Chemistry
For a Better Tomorrow

Product Databook

*Activated Alumina / Hydraulic Alumina
(Excerpt)*



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<Important Notice for Users of this Databook>

- (1) *All data in this data book is typical and not guaranteed. The typical properties of all the listed products in this data-book are subject to change without prior notice due to continual improvements.*
- (2) *Applications mentioned in this databook are examples without any guarantee. Fitness for any particular purpose should be verified by customers.*
- (3) *Please refrain from using products in this databook for medical and food applications.*

4. Activated Alumina / Hydraulic Alumina

Activated Alumina : Powder Shape

Typical Properties		Product	Powders				Chromatography Grade	
			KC-501	A-11	AC-11	AC-12R	KCG-30	KCG-1525W
Chemical Composition	L.O.I	[%]	4.5	4.0	4.5	4.5	3.5	3.5
	Fe2O3	[%]	0.01	0.02	0.02	0.02	0.02	0.02
	SiO2	[%]	0.02	0.02	0.02	0.02	0.02	0.02
	Na2O	[%]	0.45	0.26	0.26	0.26	0.26	0.26
	Al2O3	[%]	99.5	99.7	99.7	99.7	99.7	99.7
Physical Properties	True specific gravity		-	3.1	3.1	3.1	3.1	3.1
	Apparent specific gravity (Packed bulk density)	[g/cm3]	0.3	1.1	1.1	1.1	1.1	1.1
	Mean particle size	[µm]	1.5	40-50	80-100	100-200	40-50	80-100
	Specific surface area	[m2/g]	200	150	140	130	150	140
	Pore volume	[mL/g]	-	0.30	0.30	0.30	0.30	0.30
Packing	Paper Bag / PE Bag		-	25kg	25kg	-	-	-
	Pail Can		5kg	-	-	15kg	15kg	15kg
	Drum		50kg	-	-	180kg	-	-

Easy to be adsorped ↑	organic acid	PO_4^{-3}	F^-
	water		
	alcohol	F^-	
	amine		
	mercaptan	$[Fe(CN)_6]^{-4}$	
	aldehyde		Cl^-
	ketone	SO_4^{-2}	
	ester		
	ether	$[Fe(CN)_6]^{-3}$	
	aromatic hydrocarbon	$Cr_2O_7^{-2}$	Br^-
Difficult to be adsorped ↓	sulfide	Cl^-	
	organic halogen		
	unsaturated hydrocarbon	MnO_4^-	
	saturated hydrocarbon	ClO_4^-	I^-

Activated Alumina can be used as an adsorption refining agent, especially to refine non-polar solvents.

In general, the more polarity and heavier molecular weight, the better adsorption effect would be obtained.

Adsorption order example as follows.
 $-SO_3H > -COOH > -OH, -NH_2, -SH > -CHO$
 $> -CO > -COOR > -S-, -O- > -X$
 $> \text{Unsaturated hydrocarbons}$
 $> \text{Saturated hydrocarbons}$

Adsorption performance can be measured in terms adsorption rate and transmitting rate of the picric acid by sending a benzene solution of picric acid through a column filled with activated alumina.

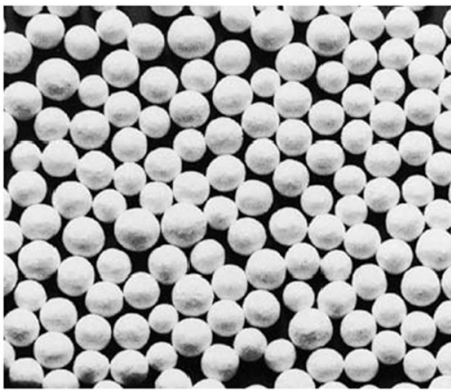
Activated Alumina : Spherical (KH)

Typical Properties		Product	KHS		KHA		KHO			KHD	
			-46	-46	-24	-46	-24	-12	-46	-24	
Appearance	Form		Spherical								
	Color		White								
	Particle Size	[mm]	4-6	4-6	2-4	4-6	2-4	1-2	4-6	2-4	
Chemical Composition	L.O.I	[%]	3.5	1.9		1.5		2.4	5.4		
	Fe2O3	[%]	0.02	0.02		0.02			0.02		
	SiO2	[%]	0.02	0.02		0.02			0.02		
	Na2O	[%]	0.04	0.26		0.26			0.26		
	Al2O3	[%]	99.9	99.7		99.7			99.7		
Physical Properties	Bulk density	[kg/L]	0.60	0.73	0.74	0.80	0.83	0.85	0.82	0.86	
	Pore volume	[mL/g]	0.64	0.51		0.43			0.38		
	Specific surface area	[m2/g]	155	150		140		190	270		
Mechanical strength	Attrition loss	[%]	0.3	0.4		0.4		0.2	0.2		
	Crushing strength	[daN]	17	26	13	33	18	5	30	16	
H2O Adsorption	Effluent gas moisture	[gH2O/m3]							0.003		
	Adsorption Capacity	10% RH	[%]						5.3	5.5	
		50% RH	[%]						13.6	14.8	
		90% RH	[%]						34	34.1	
Packing		Drum	120kg	130kg		150kg			160kg		
		Square Can	10kg	10kg		15kg		-	15kg		
		Paper bag	-	-		-		20kg	-		

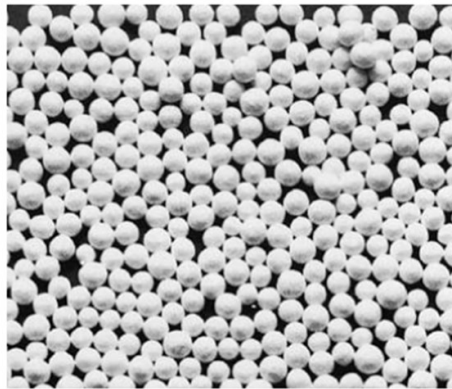
Activated Alumina : Spherical (NK)

Typical Properties		Product	NKHD				NKHO	HD	FD
			-46	-24	-46HD	-24HD	-24	-13	-24
Appearance	Form		Spherical						
	Color		White						
	Particle Size	[mm]	4-6	2-4	4-6	2-4	2-4	1-2	2-4
Chemical Composition	L.O.I	[%]	6.4		5.9		1.8	6.1	6.3
	Fe2O3	[%]	0.02						
	SiO2	[%]	0.02						
	Na2O	[%]	0.26						
	Al2O3	[%]	99.7						
Physical Properties	Bulk density	[kg/L]	0.60	0.64	0.74	0.77	0.61	0.80	0.68
	Pore volume	[mL/g]	0.60		0.45		0.62	0.45	0.55
	Specific surface area	[m2/g]	300		290		170	290	280
Mechanical strength	Attrition loss	[%]	0.3		0.3		0.2	0.4	0.2
	Crushing strength	[daN]	10	5	30	16	5	5	7
H2O Adsorption	Effluent gas moisture	[gH2O/m3]	0.003		0.003				0.003
	Adsorption Capacity	10% RH	[%]	5.7	5.7	5.8	6.1		5.8
		50% RH	[%]	15.5	16.0	15.7	16.7		16.0
		90% RH	[%]	37.8	39.3	37.0	38.2		37.0
Packing		Drum	120kg		150kg		120kg	150kg	120kg
		Square Can	10kg		15kg		10kg	-	10kg

NK contains more macropores than KH and has larger pore volume and the weight is lighter.



KHD-46(Actual)



KHD-24(Actual)

Hydraulic Alumina

Typical Properties		Product	BK-112
Chemical Composition	L.O.I	[%]	6.6
	Fe ₂ O ₃	[%]	0.05
	SiO ₂	[%]	0.01
	Na ₂ O	[%]	0.25
	Al ₂ O ₃	[%]	99.7
Physical Properties	True specific gravity		3.0
	Apparent specific gravity (Packed bulk density)	[g/cm ³]	1.0
	Mean particle size	[μm]	16
Packing	Drum		150kg
	Pail Can		15kg
	Paper Bag		20kg

An alumina powder with a large surface area and some crystal water.

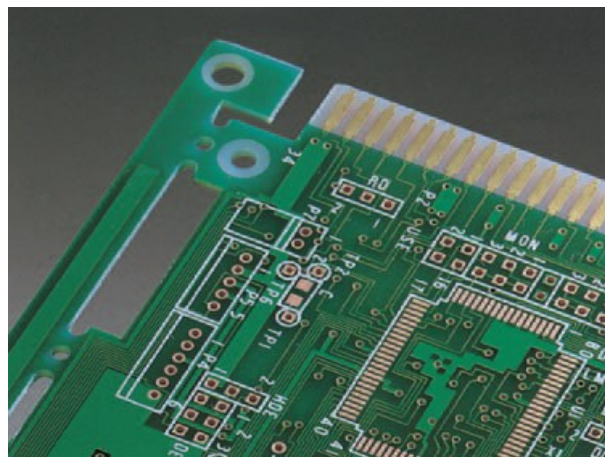
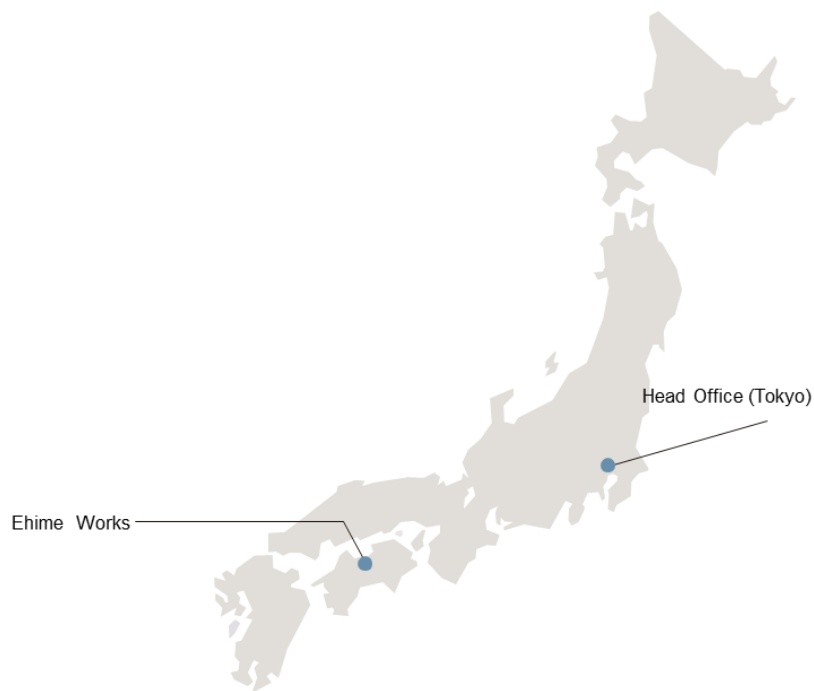
Used as a binder for refractories instead of alumina cement due to large caking capacity and plasticity.

Condition/setting time of the hydraulic alumina and water mixture

Water Volume (g/100g-Al ₂ O ₃)	Kneaded material condition	Setting Time* (min.)
60	Dry	-
70	Impossible to knead	-
75	Creamy	-
80	Creamy	15
90	Slurry with good fluidity	20

* Setting time is determined by JIS R 5210 needle penetration method (slurry thickness 38mm). Distance between the slurry bottom and the needle is 25mm.

Plant & Office Location / Contact



Aluminum Hydroxide as CCL flame retardant.



High Purity Alumina as a sapphire raw material.

Contact for Sales and Technical Information (All Products)



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