



**SKTB  
KATALIZATOR**

FROM SCIENTIFIC IDEA  
TO PRACTICAL IMPLEMENTATION

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# CATALYTIC TECHNOLOGIES

## GENERAL ENGINEERING

INDUSTRIAL ECOLOGY  
REFINING AND PETROCHEMICALS  
SULFUR REMOVAL



# 1 ABOUT THE COMPANY

In 1960-s, by initiative of Academician M.A. Lavrentiev, the President of the Siberian Branch of the Academy of Sciences of the USSR, the complex of R&D institutes and design bureaus was created near Novosibirsk city for commercialization of scientific ideas and developments.

In 1970-s, the Special Design and Engineering Bureau for pilot manufacturing of catalysts was created by Academician G.K. Boreskov, the Director of the Institute of Catalysis, to provide solutions for commercial catalysis applications.



Today Katalizator JSC is a leading Russian company for development and manufacturing of catalysts, sorbents, dryers and supports. We offer a full range of services for the following industries:

- Industrial Ecology
- Petrochemicals and Refining
- Sulfur removal

## OUR RESEARCH AND PRODUCTION CAPABILITIES

### 4 PRODUCTION SITES

#### NOVOSIBIRSK

Head R&D Center for development and manufacturing of catalysts and processes.  
Total production capacity for catalysts and sorbents up to 5000 MTY

#### ACHINSK

Production capacity of thermally-activated alumina (feedstock) up to 15 000 MTY

#### RYAZAN

Total production capacity for refining catalysts up to 6 000 MTY

#### LINYEVO

Feedstock primary processing for manufacturing catalysts, sorbents and dryers.  
Production capacity up to 9 000 MTY

## KEY FACTS ABOUT THE COMPANY

- Established in 1970
- 4 production sites
- Portfolio includes over 70 types of catalysts, sorbents, dryers and supports
- Over 30 state-of-the-art R&D laboratories with advanced equipment
- 38 active patents and 138 invention certificates
- Over 60 customers in Russia, CIS and far-abroad countries

# 2

## COMPETITIVE ADVANTAGES

### FROM SCIENTIFIC IDEA TO PRACTICAL IMPLEMENTATION

We provide everything necessary for scale-up and commercialization of your ideas, inventions and know-how for catalysts and catalytic processes development.

### WE GUARANTEE SUSTAINED PRODUCT HIGH QUALITY

Our state-of-the-art research and production facilities and non-stop quality control according to ISO:9001 ensure catalyst manufacturing with desired values and sustained high quality.

### ALLROUND ENGINEERING

We provide you with process audit of the unit, package turnkey solution, catalyst operation training and process supervision services.

# 3

## SALES GEOGRAPHY





# 4 PACKAGE OF ENVIRONMENTAL ENGINEERING SOLUTIONS



## ALL-ROUND ENGINEERING

- Development of package turnkey solutions for industrial emissions treatment
- Process audit and diagnosing the causes of low efficiency of existing catalytic units
- Engineering design, manufacturing and supply of commercial units
- Supervision at all stages: start-up, operation, shutdown and reloading of catalyst

## ENVIRONMENTAL CHALLENGES

## OUR SOLUTIONS

NOx removal	AOK-78-55 alumina vanadium catalyst
Deep (complete) oxidation of volatile organic compounds	<ul style="list-style-type: none"> <li>•ICT-12-8 alumina copper chromium catalyst</li> <li>•ICT-12-40 (Z2) alumina-supported manganese oxide catalyst</li> <li>•AOK-75-41 alumina manganese oxide catalyst</li> <li>•AOK-75-45 alumina cobalt chromium catalyst</li> </ul>
Catalytic decomposition of ozone	AOK-78-52 copper oxide catalyst
Absorption (sorption) of VOC	AOK-63-32 carbon-alumina sorbent
Deep (complete) oxidation of volatile organic compounds (VOC), including catalytic combustion of methane	AOK-75-47 alumina copper chromium catalyst
Deep (complete) oxidation of volatile organic compounds (VOC), including catalytic combustion of carbon monoxide (CO)	CT-12-6 alumina-copper oxide catalyst

## AOK-78-55 ALUMINA VANADIUM CATALYST

Alumina vanadium catalyst is designed for selective catalytic reduction of NOx with ammonia.

### APPLICATION

- Fertilizer manufacturing
- Nitric acid production
- NOx removal

### ADVANTAGES AND FEATURES

- Increased mechanical strength and activity in selective reduction of NOx with ammonia
- Lifetime is 5-10 years
- Operating temperature range is 220-340°C
- More than 19 years of successful commercial experience



### CHARACTERISTICS

PARAMETER	STANDARD			
	AOK-78-55	AOK-78-55M	AOK-78-55K	AOK-78-55KM
Appearance:	Cylindrical pellets		Rings	
- shape				
- color	Yellow or yellow-green			
Pellet size, mm:				
- max. length	18	18	-	-
- length range	-	-	5-10	5-10
- diameter	5±1	5±1	-	-
- min. internal diameter	-	-	2	2
- outer diameter range	-	-	6.5-8.5	6.5-8.5
Catalytic activity	98.0	99.9	98.0	99.9
NOx removal efficiency, %	(230°C)	(340°C)	(230°C)	(340°C)

## ICT-12-8 ALUMINA COPPER CHROMIUM CATALYST

Medium-temperature alumina copper chromium catalyst. Applied for removal of volatile organic compounds (VOC) and carbon monoxide from industrial tail gases.

### APPLICATION

- Paint and varnish industry
- Furniture industry
- Wood industry
- Chemical industry
- Automobile industry
- Manufacturing of plasticizers, adhesive tape, phenol-formaldehyde resin, polyethylene foam, etc.



### ADVANTAGES AND FEATURES

- High catalytic activity at medium temperatures (400°C and up)
- Lifetime is 5 years and more
- Resistant to catalytic poisons, including sulfur compounds
- No noble metals in catalyst composition
- Can be operated both at steady-state and non-steady state conditions (reverse process)
- More than 17 years of production experience

### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance:	Pellets	
- shape	Rings	
- color	Black, greenish shade is allowed	
Size, mm:		
- outer diameter	4.5±1.5	15±2
- wall thickness	-	3.5±0,5
- length	15±10	15±3
Catalytic activity	≥0.55•10 <sup>-2</sup>	
Rate of n-butane oxidation at 400°C, sm <sup>3</sup> /g•c		

Note: ICT-12-8, Grade B, with outer diameter 8- 25 mm is available upon request.

## ICT-12-40 (Z2) ALUMINA-SUPPORTED MANGANESE OXIDE CATALYST

Applied for removal of volatile organic compounds (VOC), combustion of organic compounds and carbon monoxide in industrial tail gases and methane in mine gases.

### APPLICATION

- Paint and varnish industry
- Furniture industry
- Wood industry
- Chemical industry
- Automobile industry
- Manufacturing of plasticizers, adhesive tape, phenol-formaldehydesin, polyethylene foam, etc.

### ADVANTAGES AND FEATURES

- High catalytic activity at high temperatures
- High thermal stability (up to 1000°C without loss of activity and strength)
- Lifetime is 10 years and more;
- Resistant to catalytic poisons, including chlorine-, fluorine-, sulfur-containing compounds
- No noble metals in catalyst composition
- Can be operated both at steady-state and non-steady state conditions (reverse process)
- More than 18 years of production experience.



### CHARACTERISTICS

PARAMETER	STANDARD		
	AM-1	AM-2	AM-4
Appearance: - shape - color	Ring	Brown, gray shade is allowed	Cylinder
Pellet size, mm: - outer diameter - wall thickness - length	10±2 3.0±0.5 10±2	15±2 3.5±0.5 15±3	4.0±1.5 - 15±10
Catalytic activity Rate of n-butane oxidation at 400°C, sm <sup>3</sup> /g•c		≥0.5•10 <sup>-2</sup>	

## AOK-78-52 COPPER OXIDE CATALYST

Applied for catalytic ozone decomposition in water treatment systems, pools and for complete oxidation of carbon monoxide.

### APPLICATION

- Manufacturers applying small-size and mid-size process equipment
- Water treatment
- Chemical industry
- Personal protective equipment

### ADVANTAGES AND FEATURES

- Can be operated at room temperature (the process of catalytic ozon decomposition)
- No noble metals in catalyst composition
- Non-toxic
- High rate of ozone decomposition between 25-50°C
- Removal efficiency up to 99,5%
- More than 20 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance: - shape - color		Cylinders Black
Size, mm: - diameter - length		4.0±0.5 7.5±2.5
Rate of n-butane oxidation at 400°C, sm <sup>3</sup> /g•c		≥0.90 • 10 <sup>-2</sup>

## AOK-63-32 CARBON-ALUMINA ADSORBENT

Applied for organic compounds removal from gas industrial, used in adsorption and catalytic adsorption processes. Mass content of carbon - up 50%.

### APPLICATION

- Chemical industry
- Pharmaceutical industry
- Refining industry
- Nitrogen and nitrogen compounds making industry

### ADVANTAGES AND FEATURES

- Catalyst shape ensures optimal hydrodynamic parameters of the reactor
- High strength, high specific surface area
- Optimal porous structure
- Performance efficiency is retained after regeneration cycles
- Efficient in trapping of benzene, acetone, isopropanol vapors and other organic compounds from gases in dry and wet reaction mixtures
- More than 17 years of operating experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance: - shape - color	Cylinders	Black or grey Ring-shaped pellets
Pellet size, mm: - outer diameter - length, range - wall thickness, range	5.0±0.5 4-15 -	8.0±0.5 6-10 2-3

## AOK-75-41 ALUMINA MANGANESE OXIDE SPHERICAL CATALYST

Spherical catalyst for complete oxidation of volatile organic compounds (VOC). Applied for combustion of organic compounds and carbon monoxide in industrial tail gases as well as for catalytic combustion of methane.

### APPLICATION

- Paint and varnish industry
- Furniture industry
- Wood industry
- Chemical industry
- Automobile industry
- Manufacturing of plasticizers, adhesive tape, phenol-formaldehyde resin, polyethylene foam, etc.

### ADVANTAGES AND FEATURES

- High activity at high temperatures (from 700°C and up)
- High thermal stability (up to 1000°C)
- Lifetime is 5 years and more
- Resistant to catalytic poisons, including chlorine-, fluorine-, sulfur-containing compounds
- No noble metals in catalyst composition
- Can be operated both at steady-state and non-steady state conditions (reverse process)
- More than 15 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE V
Appearance: - shape - color		Spheres Brown with different shades
Pellet size: - diameter, mm	2.5-3.5	3.0-5.0
Rate of n-butane oxidation at 400°C, sm <sup>3</sup> /g•c		≥1.25 • 10 <sup>-2</sup>

## AOK-75-45 ALUMINA COBALT CHROMIUM CATALYST

Catalyst is intended for removal of hazardous volatile organic compounds (VOC).

### APPLICATION

- Paint and varnish industry
- Furniture industry
- Wood industry
- Chemical industry
- Automobile industry
- Manufacturing of plasticizers, adhesive tape, phenol-formaldehyde resin, polyethylene foam, etc.

### ADVANTAGES AND FEATURES

- Sulfur compounds resistance
- Operating temperature range is 400-7000°C
- High mechanical strength
- More than 9 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Ring-shaped pellets Dark green
Size, mm: - outer diameter - wall thickness - length range	13.5-15.5 2.8-3.2 11-15
Catalytic activity Rate of n-butane oxidation at 400°C, $\text{sm}^3/\text{g}\cdot\text{c}$	$\geq 2.0 \cdot 10^{-2}$

Length can be changed upon request

## AOK-75-47 SMALL-SIZED SPHERICAL ALUMINA COPPER CHROMIUM CATALYST

Applied for combustion of organic compounds and carbon monoxide in industrial tail gases, as well as for catalytic combustion of methane.

### APPLICATION

- Paint and varnish industry
- Furniture industry
- Wood industry
- Chemical industry
- Automobile industry
- Manufacturing of plasticizers, adhesive tape, phenol-formaldehyde resin, polyethylene foam, etc.

### ADVANTAGES AND FEATURES

- High catalytic activity and increased strength
- Operating temperature range is 400-700°C
- More than 4 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Spherical pellets Black or olive-colored
Pellet size, diameter, mm	1.0-2.8
Catalytic activity Rate of n-butane oxidation at 400°C, $\text{sm}^3/\text{g}\cdot\text{c}$	$\geq 1.8 \cdot 10^{-2}$



# ICT-12-6 ALUMINA-COPPER OXIDE CATALYST

Applied for removal of carbon monoxide and organic impurities from industrial gas emissions, as well as for fine purification of inert gases from oxygen.

## APPLICATION

- In gas treatment units for removal of formaldehyde, methanol and carbon monoxide impurities from gas emissions
- Manufacturing of formaldehyde

## ADVANTAGES AND FEATURES

- No noble metals in catalyst composition
- Optimal shape of pellets ensure slow hydraulic resistance in bed
- Non-waste production



## CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance: - shape - color	Cylinders Dark grey color	Rings
Size, mm, range - outer diameter - length - internal diameter	3,0-5,5 5-15 -	11-15 7-15 6-10
Catalytic activity Rate of n-butane oxidation at 400°C, sm <sup>3</sup> /g•c	≥1.8 • 10 <sup>-2</sup>	

# 5 PACKAGE OF ENGINEERING SOLUTIONS FOR REFINING AND PETROCHEMICALS



## ALLROUND ENGINEERING

- Process audit (study) of unit, testing of applied catalysts performance and recommendation of optimal catalyst ensuring process efficiency
- Basic and Detailed Engineering for revamping/optimization of the unit and supervision of revamping, start-up and operation of the unit
- Wide range of in-house catalysts providing customer-tailored and optimal solutions for handling refining and petrochemical challenges

## REFINING AND PETROCHEMICALS CHALLENGES

## OUR SOLUTIONS

Light naphtha isomerization	AOK-72-55 catalyst
Dehydrogenation of paraffins in a fluidized bed	AOK-73-24, AOK-73-24 (RF) and AOK-73-21 catalysts
Methyl mercaptan synthesis in methionine production process	ICT-31-1 catalyst
Conversion of dimethyl sulfide to methyl mercaptan in methionine production process	ICT-32-1 catalyst
Aniline synthesis and low-temperature CO shift conversion	AOK-71-22 copper chromium zinc catalyst
Gas drying, oil purification (removal of oxygenates) and equipment preservation	<ul style="list-style-type: none"><li>•AOK-63-22 alumina dryer and catalyst support</li><li>•AOK-63-22C alumina dryer</li><li>•AOK-63-22K alumina</li></ul>

## AOK-72-55 CATALYST FOR C<sub>5</sub>/C<sub>6</sub> LOW-TEMPERATURE ISOMERIZATION

Applied in isomerization of light gasoline fractions.

### APPLICATION

- Refining industry (for production of Euro-5 fuels)

### ADVANTAGES AND FEATURES

- Resistant to skips of sulfur, nitrogen and water; process upsets do not result in irreversible loss of activity
- Activity and conversion degree of normal paraffins competing with chlorinated alumina catalysts
- The injection of chloriding agent is not required to maintain catalyst activity
- Is more advantageous for naphthenic ring - opening compared to chlorinated alumina catalyst
- High selectivity contributes to low hydrogen consumption
- Resistant to fluctuations of feed space velocity: 0.5 to 3,0h<sup>-1</sup>
- Cycle length upon condition of technology requirements is 5-6 years
- Regenerability: withstands 3-4 regenerations without losing activity
- Lifetime is 10-12 years



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Cylindrical pellets Light grey
Size, diameter, mm	2.5±0.5
Bulk density, g/sm <sup>3</sup>	1.1-1.4
Strength factor, N/mm, average, min.	12.0
Platinum content, wt. %	0.22-0.30
Catalyst performance: - isopentane activity, %, min. - 2,2-dimethylbutane activity, %, min. - selectivity, %, min.	70 26 98

## AOK-73-24, AOK-73-24 (RF), AOK-73-21 CATALYSTS FOR DEHYDROGENATION OF LOWER PARAFFIN HYDROCARBONS

Applied in C<sub>3</sub>-C<sub>5</sub> dehydrogenation in a fluidized bed.

### APPLICATION

- Petrochemicals
- Production of MTBE
- Synthetic rubber production

### ADVANTAGES AND FEATURES

- High catalytic activity
- Homogeneous PSD ensures optimal hydrodynamic conditions of fluidization in the reactor
- Low consumption rate
- Low abrasivity at high strength
- High thermal stability



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance	Powder of grey and green color
PSD (Particle Size Distribution)	Customized according to specific needs of the Customer's unit
Bulk density, g/sm <sup>3</sup>	1.0-1.4
BET surface area, m <sup>2</sup> /g	100-160
Catalytic activity at 570°C: - i-butane conversion, %, min. - isobutene selectivity, %, min.	50 88

## ICT-31-1 CATALYST FOR METHYLMERCAPTAN SYNTHESIS FROM METHANOL AND HYDROGEN

Is intended for methyl mercaptan synthesis in production of methionine at 350-420°C.

### APPLICATION

- Production of methionine
- Chemical industry

### ADVANTAGES AND FEATURES

- Optimal chemical composition ensures high activity and selectivity
- Optimal porous structure ensures high performance due to resistance to deactivation
- Increased strength and optimal pellet size ensures optimal hydrodynamic process parameters
- One-of-a-kind catalyst on the Russian market
- More than 30 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance: - shape - color	Spheres White, cream and pink shades are allowed	
Catalytic activity: - methylmercaptan mole fraction, %, min. - dimethylsulfide mole fraction%, max. - selectivity, %, min.	53 1.7 93	65 1.1 96

## ICT-32-1 CATALYST FOR CONVERSION OF DIMETHYL SULFIDE TO METHYL MERCAPTAN

Applied for conversion of dimethylsulfide to methyl mercaptan for methionine production.

### APPLICATION

- Production of methionine
- Chemical industry

### ADVANTAGES AND FEATURES

- Optimal chemical composition ensures high activity and selectivity
- Optimal porous structure ensures high performance due to resistance to deactivation
- Increased strength and optimal pellet size ensures optimal hydrodynamic process parameters
- One-of-a-kind catalyst on the Russian market
- More than 30 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE B	GRADE V
Appearance: - shape - color	Spheres White, crème and pink shades are allowed	
Catalytic activity: rate of conversion of DMS to methylmercaptan, mole/sm <sup>3</sup> • h, min. - at (320±20) °C - at (370±10) °C	20 2	- -



## AOK-71-22 COPPER CHROMIUM ZINC CATALYST

Applied for aniline synthesis and low temperature conversion of carbon monoxide with water steam (CO).

### APPLICATION

- Paint and varnish industry
- Chemical industry

### ADVANTAGES AND FEATURES

- High activity, strength and thermal stability up to 500 °C
- More than 6 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Cylinders Black
Size, mm: - diameter - height, range	5±1 4-8

## AOK-63-22 ALUMINA DRYER AND CATALYST SUPPORT

Applied for gas drying in refining, chemical and gas processing industry; as oxygen ate scavenger of oil, as static adsorbent for equipment preservation.

### APPLICATION

- Gasoline stations
- Oil and gas processing
- Chemical industry

### ADVANTAGES AND FEATURES

- High strength
- Optimal porous structure
- High specific surface area
- Ensures gas drying with dew point -40 to -73.3°C
- Resistant to condensed moisture
- Can be used as the support for other types of catalysts



### CHARACTERISTICS

PARAMETER	STANDARD			
	0-1	0-2	0-3	0-4
Appearance: - shape - color	Cylinders White, crème and pink shades are allowed			
Pellet size, mm - diameter - length, max.	3.0±0.5 N/A	5.0±1.0 30	5.0±1.0 N/A	5.0±1.0 13±5
Static activity of steam adsorbtion from air at 20-25 °C , gram of water/100 gram of dryer, min.:				
- relative humidity 10-12%	4	5	4	N/A
- relative humidity 60-62%	10	15	10	N/A

## AOK-63-22C ALUMINA DRYER

Applied for gas drying in refining, chemical and gas processing industry, as oxygenate scavenger of oil, as static adsorbent for equipment preservation.

### APPLICATION

- Gasoline stations
- Oil and gas processing
- Chemical industry

### ADVANTAGES AND FEATURES

- High strength
- Optimal porous structure
- High specific surface area
- Ensures gas drying with dew point -40 to -73.3°C
- Resistant to condensed moisture
- Can be used as the support for other types of catalysts
- Applied in multi bed systems in combination with silica gel or molecular sieves
- More than 11 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Spheres White
Pellet size, diameter, mm	5.0±1.0
Static activity of steam adsorption from air at 20-25 °C , gram of water/100 gram of dryer, min.: - relative humidity 10% - relative humidity 60%	5 13

## AOK-63-22K RING-SHAPED ALUMINA DRYER AND CATALYST SUPPORT

Applied for gas drying in refining, chemical and gas processing industry, as oxygenate scavenger of oil, as static adsorbent for equipment preservation.

### APPLICATION

- Gasoline stations
- Oil and gas processing
- Chemical industry

### ADVANTAGES AND FEATURES

- High strength
- Optimal porous structure
- High specific surface area
- Ensures gas drying with dew point -40 to -73.3°C
- Resistant to condensed moisture
- Can be used as the support for other types of catalysts
- More than 13 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance: - shape - color	Ring-shaped pellets White, cream shade is allowed	
Size, mm: - diameter - length - internal diameter, min.	7.5±1.0 7.5±2.5 2.0	
Static activity of steam adsorption from air at 20-25 °C , gram of water/100 gram of dryer, min.: - relative humidity 10% - relative humidity 60%	4 10	

# 6 PACKAGE OF ENGINEERING SOLUTIONS FOR SULFUR REMOVAL



## ALLROUND ENGINEERING

- Process audit (study) of sulfur recovery unit and recommendations on process optimization
- Development of solutions for reactor loading, supervision at stages of catalyst loading/unloading, start-up and shutdown of sulfur recovery unit
- Testing of catalyst physicochemical properties and performance before-and-after service using advanced scientific instrumentation
- Manufacturing and supply of in-house catalyst package.

## SULFUR REMOVAL CHALLENGES

Purification of natural and industrial gases from hydrogen sulfide and sulfur compounds for production of sulfur as a finished commercial product

Increasing sulfur recovery efficiency

## OUR SOLUTIONS

Applying the optimal catalyst package selected from the following portfolio:

AOK-75-46 titanium dioxide catalysts (A, B and V grades)

AOK-78-59 conventional alumina catalyst

AOK-78-61 alumina catalyst

AOK-75-33 alumina catalyst

AOK-75-44 alumina catalyst

## AOK-78-61 CLAUS ALUMINA SPHERICAL CATALYST FOR SUPPORT LAYER

Is intended for improved gas distribution in the reactor, is used as a catalyst and active bed support layer.

### APPLICATION

- Refining industry
- Oil producing industry
- Gas processing industry
- Smelters

### ADVANTAGES AND FEATURES

- Is also used as a Claus catalyst so to increase the unit operational resource
- Less bulk density compared to the porcelain spheres
- More than 8 years of production experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE V
Appearance: - shape - color	Spheres White, shades are allowed	
Pellet size, diameter, mm	6-10	10-17

## AOK-75-44 CLAUS CATALYST FOR SELECTIVE OXIDATION OF HYDROGEN SULFIDE TO SULFUR

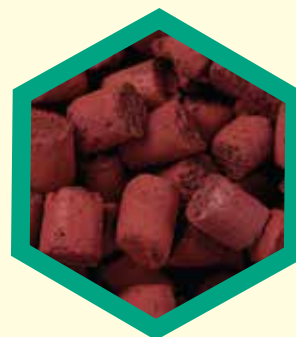
Claus catalyst for selective (direct) oxidation of hydrogensulfide to sulfur.  
Mainly applied at sulfur recovery units (Claus process).

### APPLICATION

- Refining industry
- Oil producing industry
- Gas processing industry
- Gas production industry
- Smelters

### ADVANTAGES AND FEATURES

- High catalytic activity and selectivity of hydrogen sulfide conversion to sulfur at the range of 220-280°C
- Resistance to catalytic poisons
- Thermal stability
- More than 12 years of commercial experience



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Cylinders Red and brown
Pellet size, mm: - diameter - length	4-10 4-15
Mass content of Ferrous (III) oxide, %, min.	70



## AOK-75-46 CLAUS TITANIUM DIOXIDE CATALYST

Applied at Claus sulfur recovery units at I, II and III stages of treatment of natural and industrial gases of different origin. Grade A, B - Titanium dioxide and alumina composite catalyst. Grade V - Titanium oxide catalyst.

### APPLICATION

- Refining industry
- Oil producing industry
- Gas processing industry
- Smelters

### ADVANTAGES AND FEATURES

- Ensures high activity in main Claus reaction as well as in reactions of sulfur organic compounds conversion
- Due to high resistance to hydrothermal aging can be used in the reactors of sulfur recovery units
- Improved porous structure
- High resistance to deactivation (sulfate poisoning)
- Great commercial experience



### CHARACTERISTICS

PARAMETER	STANDARD		
	GRADE A	GRADE B	GRADE V
Appearance: - shape - color		Extrudate White	
Pellet size, mm: - diameter - length		3.5±1.0 5-15	
Mass content of Titanium (IV) oxide (expressed as catalyst calcinated at 800°C), %, min.	30	70	90

## AOK-78-59 ALUMINA SPHERICAL CLAUS REACTION CATALYST

### APPLICATION

- Refining industry
- Oil producing industry
- Gas processing industry
- Smelters

### ADVANTAGES AND FEATURES

- Ensures high activity in main Claus reaction as well as in reactions of sulfur organic compounds conversion
- High surface area and mechanical strength, improved porous structure
- Exhibits high-quality thermal treatment
- Minimum life time is 4 years
- More than 14 years of commercial experience



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance: - shape - color	Sphere White, shades of cream, pink and yellow are allowed	Cylinder
Pellet size: - diameter, mm - length, mm	4.0-6.3 -	5±1 5-20

## AOK-75-33 OXYGEN SCAVENGER TO PROTECT CLAUS CATALYSTS AGAINST SULFATE POISONING

Applied in Claus sulfur recovery units to protect active bed alumina catalysts against sulfate poisoning.

### APPLICATION

- Refining industry
- Oil producing industry
- Gas processing industry
- Smelters

### ADVANTAGES AND FEATURES

- High catalytic activity
- More than 10 years of commercial experience



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Spheres Light yellow and brown
Pellet size, diameter, mm	4.0-6.3
Chemical composition	Aluminium oxide promoted with Iron compounds

## 7 OTHER PRODUCTS

### AOK-63-29 SPECIALIZED ALUMINA SUPPORT

Applied as adsorbent and support for catalyst preparation.

### APPLICATION

- Chemical industry
- Petrochemicals

### ADVANTAGES AND FEATURES

- High strength and thermal stability



### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE B
Appearance: - shape - color	Spheres White, shades are allowed	
Diameter of pellets, mm	1.0-2.0	1.5-2.5

## AOK-63-11 SMALL-SIZED SPHERICAL ALUMINA

Applied as adsorbent for catalyst preparation and as adsorbent-dessicant.

### APPLICATION

- Chemical industry
- Petrochemicals
- Pharmaceuticals

### ADVANTAGES AND FEATURES

- $\gamma$ -Al<sub>2</sub>O<sub>3</sub>
- Ultra-high mechanical strength
- Increased pore volume



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Spheres White, shades are allowed
Diameter of pellets, mm	0.4-1.0

## AOK-63-14 ALUMINA SMALL-SIZED SPHERICAL MODIFIED SUPPORT FOR CATALYSTS / SORBENTS

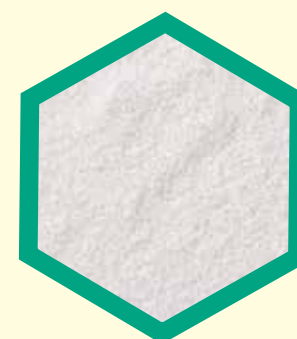
Applied as the support, active component and adsorbent-dessicant.

### APPLICATION

- Chemical industry
- Medical industry
- Pharmaceuticals

### ADVANTAGES AND FEATURES

- Increased pore volume and high specific surface area



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Powder White, shades of cream and pink are allowed

## AOK-63-21 ALUMINA CATALYST FOR CHROMATOGRAPHY

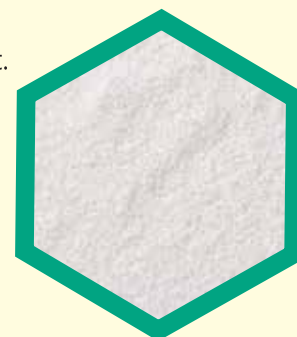
Applied in pharmaceuticals, thin-layer chromatography. Is used as a support and sorbent.

### APPLICATION

- Pharmaceuticals
- Chemical industry
- Chromatography

### ADVANTAGES AND FEATURES

- High specific surface area and strength



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance	Powder of white color, inclusions of dark color are allowed

## AOK-63-91 ALUMINUM HYDROXIDE / BINDER FOR COMPOSITE CATALYSTS

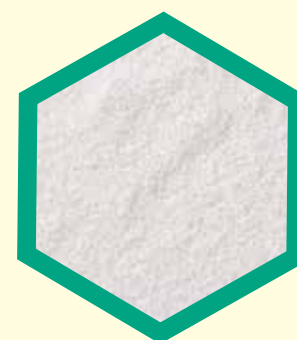
Applied as an intermediate for preparation of supports, catalysts and sorbents.

### APPLICATION

- Chemical industry
- Petrochemical industry

### ADVANTAGES AND FEATURES

- Ensures high strength characteristics of the final products.



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance	Powder of white color
Mass fraction of Iron oxide, %, max.	0.10
Mass fraction of Sodium oxide, %, max.	0.12

## AOK-63-92 THERMALLY ACTIVATED MICRO-FINE (HIGH-DISPERSION) ALUMINUM HYDROXIDE

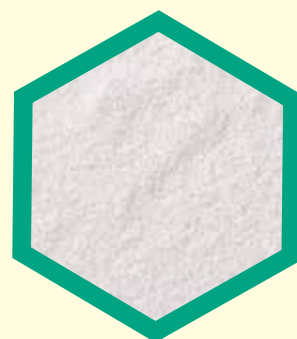
Applied as an intermediate for preparation of supports, catalysts and sorbents.

### APPLICATION

- Chemical industry
- Petrochemical industry

### ADVANTAGES AND FEATURES

- Improved chemical activity
- PSD: min. fraction of particles with size 0-40  $\mu\text{m}$  is 90%



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Powder White, cream shade is allowed
Mass fraction of Sodium oxide, %, max.	0.4

## AOK-63-93 THERMALLY ACTIVATED ALUMINUM HYDROXIDE

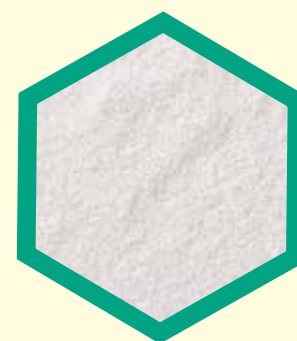
Applied as an intermediate for preparation of catalysts and supports.

### APPLICATION

- Chemical industry

### ADVANTAGES AND FEATURES

- Improved chemical activity
- Polydisperse PSD



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance: - shape - color	Powder White, shades of pink, cream and grey are allowed; inclusions of grey color are allowed
Mass fraction of Silicon dioxide, %, max.	0.33
Mass fraction of Iron (III) oxide, %, max.	0.05



## ICT-02-6M SUPPORT FOR ETHYLENE OXYCHLORINATION

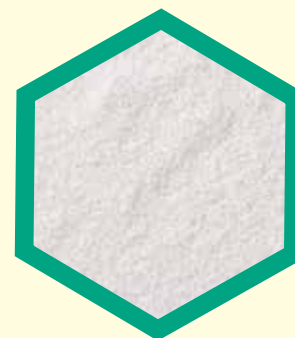
Applied as a support for ethylene oxychlorination catalysts.

### APPLICATION

- Chemical industry
- Petrochemicals

### ADVANTAGES AND FEATURES

- High chemical activity and selectivity
- High strength



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance	Microspherical powder of white color, cream shade is allowed

## AOK-71-31(NAM) - ALUMINA NICKEL MAGNESIUM CATALYST FOR BLANKETING

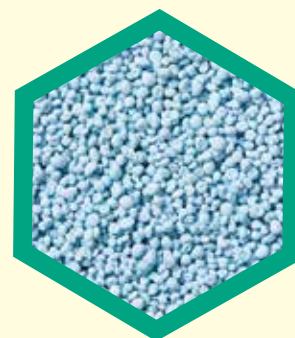
Applied for natural gas conversion for inert gas blanketing in thermal treatment used in automobile manufacturing and also for chemical and thermal treatment of parts in a fluidized catalyst bed.

### APPLICATION

- Iron and steel industry
- Machine-building industry
- Automobile industry

### ADVANTAGES AND FEATURES

- High attrition resistance and high catalytic activity



### CHARACTERISTICS

PARAMETER	STANDARD
Appearance	Small-sized sphere of light blue, grey colors

## IC-3-12 CATALYST FOR NITROUS GASES OXYGEN REMOVAL ATMOSPHERES

Applied for nitrous gases oxygen removal in production of hydroxylamine sulfate.

### APPLICATION

- Chemical production
- Production of caprolactam

### ADVANTAGES AND FEATURES

- High strength, activity and selectivity
- More than 18 years of production experience



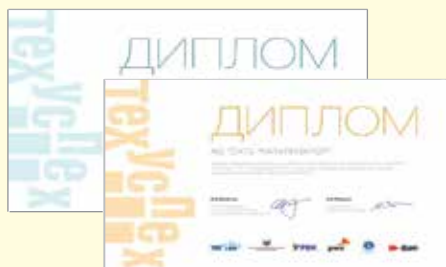
### CHARACTERISTICS

PARAMETER	STANDARD	
	GRADE A	GRADE K
Appearance: - shape - color	Cylinders	Rings
Size, mm - length - outer diameter - internal diameter	10-20 4.5-5.5 -	5-10 7-8 2-3

# 8 OUR ACHIEVEMENTS

- included in the TOP-5 Russian fast-growing technological companies according to TECHUP rating;
- a leader of TOP-15 Russian companies having the high export potential according to TECHUP rating;
- the best exporter of Novosibirsk region in 2012, 2014 and 2017;
- a winner of regional and federal stages of National Award in the field of entrepreneurial activity "Gold Mercury" as "The best enterprise - exporter in the field of industrial production" in 2017;
- a winner of award "For the successful business development in Siberia" in 2016 and 2017, holder of the official status "Reliable partner";
- a winner of the Programm «100 Best Russian Products».

## TOP-5 RUSSIAN FAST-GROWING TECHNOLOGICAL COMPANIES



## «RELIABLE PARTNER»



## «GOLD MERCURY»



# 9 OUR PARTNERS



Borekov  
Institute of  
Catalysis



NORILSK NICKEL



URALCHEM

TATNEFT



SAMSONAS  
MOTORSPORT



The strength of chemicals.



EUROCHEM  
MINERAL AND CHEMICAL COMPANY



ROSNEFT



# 10 CET INVESTMENT PROJECT

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In 2016, Katalizator JSC launched a four-year investment project  
“Implementation of the CET Technology Initiative: Catalysts, Engineering & Technologies”

- MISSION

Create a world-class research center at the premises of Katalizator JSC for development of advanced catalysts and adsorbents, scaling up production technologies, and developing high tech engineering services for commercial catalytic plants.

- CONCEPT

Revamping of office and laboratory building to create about 40 laboratories with full technical re-equipment of research and engineering infrastructures meeting global standards. Partial upgrading of industrial infrastructure. Mastering of full-scale production of three world-class catalyst types with high market potential.

**KATALIZATOR JSC INVITES COMMERCIAL PLANTS AND AUTHORS OF INVENTIONS OR KNOW-HOW TO COOPERATE WITH US IN THE AIM OF THE DEVELOPMENT OF NEW DIRECTIONS, NEW IDEAS AND SCIENTIFIC RESEARCH WORK WHICH HAVE BUSINESS PERSPECTIVES AND COMPLY WITH PRIORITY DEVELOPMENT DIRECTIONS OF CATALYTIC TECHNOLOGIES.**

**FROM SCIENTIFIC IDEA  
TO PRACTICAL IMPLEMENTATION**



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