上海太洋科技有限公司

Shanghai TaiYang Technology co.,Ltd.

CORPORATE BROCHURE

Shanghai TaiYang Technology Co.,Ltd.

公司简介 INTRODUCTION

Company profile

Shanghai TaiYang Technology Co.,Ltd is a national leading enterprise specializing in manufacturing fine chemicals with production plants mainly located in Jiangsu province in China. The company predominantly produce high purity magnesium series chemicals,dihydrogen phosphate and metaphosphate products,fluoride compounds such as inorganic specialty chemicals.Company has obtained ISO 14001:2004 certification which assures the high quality of the products which are manufactured according to environmental and safety standards.Due to well developed industry, science and technology of Yangtze River delta , TaiYang has became exceptional producer and supplier for domestic and international market.

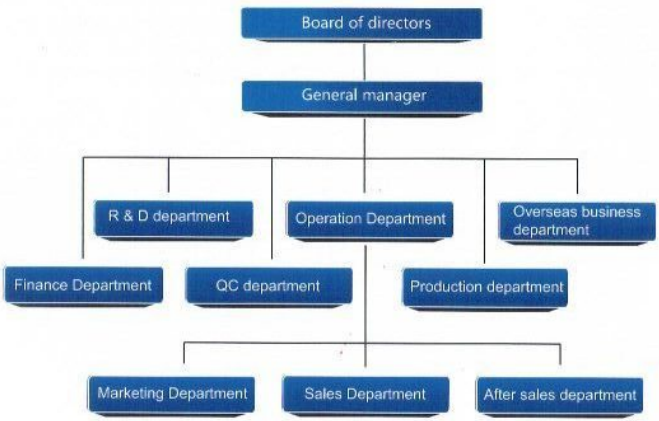
Since establishment of the company, TaiYang has invested a lot of money in research and development of magniesum and phosphates.The company puts a great emphasis on manufacturing processes. Through constant internal and external auditing and stringent controls , we do not only work with standards but also aim to achieve the best quality.Company has been recognized and praised by customers from North America, Europe, Eastern Asia and other countries for the whole production process including raw materials,synthesis and purification until the end product.

Production plant.

Factories are located in Jiangyan city, Jiangsu province, which was formerly a state -owned enterprise Jinxi Ya established in 1984.The company has begun close cooperation in 2013 with Institute of Process Engineering of Chinese Academy of Sciences.Our factories have research and development facilities to test and continuously improve all aspects of production, including the quality of the products and services.

Main products that we manufacture include high-purity magnesium, phosphates, sulfates, silicates, borates, carbonates, chloride, oxide and other specialty chemicals which are widely used for the production of optical glass, laser crystal, ceramics, as well as they are applied in biomedical,nuclear , new energy industry ,super wear-resistant metal surface treatment and other special materials industry. Since the establishment of the factory, company has been cooperating with majority of research institutes,military units,domestic and foreign enterprises and has gained good reputation for high quality products and services.We take great care to maintain high quality of our products and the trust given to us by our customers.

公司架构
THE COMPANY STRUCTURE




团队精神
Team spirit

Optical glass and laser crystal materials

Laser nuclear fusion device:

After using a laser as an ignition source, high-energy laser led directly, thermonuclear fusion reaction of deuterium and tritium occurs. Ultimately inertial confinement nuclear fusion Variable ignition combustion, fusion nuclear power plants are built to provide optimal energy for national economic development and people's lives.

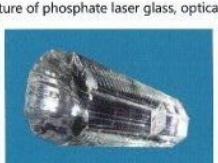
Applications: China SG device (The ninth Institute), the US National Ignition Facility (referred NIF), PHEBUS (France Li Meier laboratory), VULCAN (UK Rutherford Appleton Laboratory), HELEN (United Kingdom Atomic Weapons Center) and similar.

Dihydrogen Phosphate list

Chinese Product Name	英文名称（Product Name）	CAS No.	M.F
磷酸二氢钠	Sodium dihydrgenphoshate anhydrous	7558-80-7	NaH2PO4
磷酸二氢铝	Aluminium dihydrogen phosphate	13530-50-2	Al(H2PO4)3
磷酸二氢钾	Potassium phosphate monobasic	7778-77-0	KH2PO4
磷酸二氢锂	Lithium phosphate monobasic	13453-80-0	LiH2PO4
磷酸二氢钡	Barium dihydrogen phosphate	13466-20-1	Ba(H2PO4)2
磷酸二氢铵	Ammonium dihydrogen phosphate	7722-76-1	NH4H2PO4
磷酸二氢钙	Calcium phosphate monobasic	7758-23-8	Ca(H2PO4)2
磷酸二氢镁	Magnesium dihydrogen phosphate		Mg(H2PO4)2

注产品指标见附表。

Applications: used in the manufacture of phosphate laser glass, optical glass, high temperature adhesive.



Optical glass and laser crystal materials

Laser nuclear fusion device:

Sodium dihydrogen phosphate : Pharmaceutical supplements for the human body phosphorus content.

Potassium dihydrogen Phosphate : Manufacturing of KDP, KTP crystal ; Can also be used as a catalyst ; In the pharmaceutical industry as API 's culture medium.

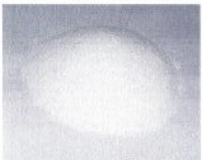
Aluminum dihydrogen phosphate : Anti-corrosive pigments ; Can be used as a hardening agent ; Used as a catalyst (general for catalytic dehydration reaction) ; Used as a coating or adhesive material, has good dielectric properties in the electrical production; In ceramic production aluminum dihydrogen phosphate is added to improve high-temperature compressive strength and flexural strength.

Lithium dihydrogen phosphate : Lithium battery cathode material, for the manufacture of lithium iron phosphate.

Ammonium dihydrogen phosphate : For the manufacture of ADP crystal ; For preparing nickel-phosphorus catalyst.

Magnesium dihydrogen phosphate : Used to manufacture drugs in rheumatoid arthritis medicine ; Used as a cathode material for lithium batteries.

Calcium dihydrogen phosphate : Analytical reagent pharmaceutical raw materials ; glass additives.



Products parameters

参数	磷酸二氢铝 Al(H2PO4)3	磷酸二氢钠 NaH2PO4	磷酸二氢钾 KH2PO4	磷酸二氢钡 Ba(H2PO4)2	磷酸二氢锂 LiH2PO4	磷酸二氢镁 Mg(H2PO4)2	磷酸二氢钙 Ca(H2PO4)2
Al2O3	16% ± 0.5% (理论值16.03%)						
Na2O		26% ± 0.5% (理论值25.83%					
K2O			35% ± 0.5% (理论值34.61%)				
BaO				46% ± 0.5% (理论值46.28%)			
Li2O					14% ± 0.5% (理论值14.38%)		
MgO						18.5% ± 0.5% (理论值18.47%)	
CaO							24% ± 0.5% (理论值23.96%)
P2O5	67% ± 1% (理论值66.98%)	60% ± 1% (理论值59.15%)	52% ± 1% (理论值52.16%)	43% ± 0.5% (理论值42.85%)	68% ± 1% (理论值68.36%)	65% ± 1% (理论值65.04%)	61% ± 1% (理论值65.04%)
Fe2O3	< 2PPM	< 2PPM	< 2PPM	< 2PPM	< 2PPM	< 2PPM	< 2PPM
Cu	< 0.1PPM	< 0.1PPM	< 0.1PPM	< 0.1PPM	< 0.1PPM	< 0.1PPM	< 0.1PPM
Ni Co Mn Pb Cr	< 1PPM	< 1PPM	< 1PPM	< 1PPM	< 1PPM	< 1PPM	< 1PPM

注:其他磷酸二氢盐也可根据要求定做。

Metaphosphate List

Chinese Name	英文名称（Product Name）	CAS	M.F
偏磷酸铝	Aluminium metaphosphate	13776-88-0	Al(PO3)3
偏磷酸钡	Barium metaphosphate	13762-83-9	Ba(PO3)2
偏磷酸钙	Calcium metaphosphate	123093-85-6	Ca(PO3)2
偏磷酸镁	Magnesium metaphosphate	13092-66-5	Mg(PO3)2
偏磷酸锂	Lithium metaphosphate	13762-75-9	LiPO3
偏磷酸钾	Potassium metaphosphate	7790-53-6	KPO3
偏磷酸锶	Strontium metaphosphate		Sr(PO3)2
偏磷酸钠	Sodium metaphosphate	10361-03-2	NaPO3
偏磷酸钇	Yttrium metaphosphate		Y(PO3)3
偏磷酸镧	Lanthanum metaphosphate		La(PO3)3

Parameters index of metaphosphates series products

参数	偏磷酸铝 Al(PO3)3	偏磷酸钠 NaPO3	偏磷酸钾 KPO3	偏磷酸钡 Ba(PO3)2	偏磷酸钙 Ca(PO3)2	偏磷酸锂 LiPO3	偏磷酸镁 Mg(PO3)2	偏磷酸镧 La(PO3)3	偏磷酸钇 Y (PO3)3
Al 2O3	19%±0.5%								
Na2O		30%±0.5%							
K2O			39%±0.5%						
BaO				52%±0.5%					
CaO					28%±0.5%				
Li2O						17%±0.5%			
MgO							22%±0.5%		
la2O2								43%±0.5%	
Y2O3									35%±0.5%
P2O5	81%±0.5%	70%±0.5%	61%±0.5%	52%±0.5%	71%±0.5%	83%±0.5%	78%±0.5%	57%±0.5%	65%±0.5%
Fe2O2	<2PPM	<2PPM	<2PPM	<2PPM	<2PPM	<2PPM	<2PPM	<2PPM	<2PPM
Ca	<0.1PPM	<0.1PPM	<0.1PPM	<0.1PPM	<0.1PPM	<0.1PPM	<0.1PPM	<0.1PPM	<0.1PPM
Ni Co Mn Pb Cr	<1PPM	<1PPM	<1PPM	<1PPM	<1PPM	<1PPM	<1PPM	<1PPM	<1PPM

注:其他偏磷酸盐也可根据要求定做。

Detailed product introduction

产品用途介绍

01

Aluminum metaphosphate

Used in phosphate glass, fluorophosphate glass and laser fusion glass ; Improve the chemical stability and mechanical strength of glass ; As a high temperature binder ; High-purity aluminum metaphosphate is a special solid materials in silicon semiconductor.

Barium Metaphosphate

Fluorophosphate glass, used mainly to change the anti-fluoride glass devitrification resistance and light absorption ; Small amount used in high power laser glass system.

02

03

Calcium Metaphosphate

Additive in phosphate glass and fluorophosphate glass ; It works as a stabilizer, increasing the glass chemical stability and mechanical strength.

Magnesium Metaphosphate

Mainly used in special optical glass, special protective glass, radiation-resistant optical glass material, phosphate glass, fluorophosphate glasses and laser fusion glass additives ; Make glass shaping by hardening slow, reducing the glass crystallization tendency and improving the chemical stability and mechanical strength ; Especially low iron Magnesium Metaphosphate is one of the raw materials used for special protective glass series, the main alternative to the series lead protective glass.

04

05

Lithium Metaphosphate

In phosphate glass and fluorophosphate glass and laser nuclear fusion glass, it can reduce the melting temperature and the viscosity of the glass,act as co-solvents ; Added in fluorophosphate glass,can reduce fluoride volume ; Lithium metaphosphate can significantly improve the performance of the glass ; Can reduce exhaust gas pollution, reduce corrosion of equipment ; It is an important raw material in new energy, glassy polymer lithium ion battery electrolytes.

Potassium metaphosphate

Phosphate glass, fluorophosphate glass, laser fusion glass additive ; Used in laser fusion glass as an additive for reducing the tendency of crystallization of glass, increasing glass transparency and gloss, effectively reduce the surface tension of the glass ; Glass clarifying agent, bleaching agent and an oxidizing agent.

06

07

Sodium Metaphosphate

Additive in phosphate glass and fluorophosphate glass, for improving the thermal stability of the glass and decreasing the glass fold emissivity.

Rare earth metaphosphates products

Lanthanum metaphosphate, Yttrium Metaphosphate, Samarium metaphosphate,Scandium metaphosphate, Niobium metaphosphate, Ytterbiummetaphosphate.
Applications: mainly used as additives in laser glass, glass fiber, low-dispersion glass.

08

Optical glass and laser crystal materials

Fluoride product catalog			
Chinese Name	英文名称（Product Name）	CAS No.	M.F
氟化镁	Magnesium fluoride	7783-40-6	MgF2
氟化钙	Calcium fluoride	7789-75-5	CaF2
氟化钡	Barium fluoride	7787-32-8	BaF2
氟化锶	Strontium fluoride	7783-48-4	SrF2
氟化铝	Aluminium fluoride	7784-18-1	AlF3
氟化钠	Sodium fluoride	7681-49-4	NaF
氟化钇	Yttrium fluoride	13709-49-4	YF3

Note: Parameters Annex.

Applications: used in the manufacture of fluoride system glass, fluorophosphate laser glass, laser crystal materials, solvent materials, optical coating materials

Carbonate product catalog			
Chinese Name	英文名称（Product Name）	CAS No.	M.F
碳酸镁	Magnesium carbonate	56378-72-4	(MgCO3)4•Mg(OH)2•5H2O
碳酸钙	Calcium carbonate	471-34-1	CaCO3
碳酸钡	Barium carbonate	513-77-9	BaCO3
碳酸锶	Strontium carbonate	1633-05-2	SrCO3
碳酸钾	Potassium carbonate	584-08-7	K2CO3

Note：Purity＞99%, Fe ≤2PPm, Cu＜0.1PPm, Ni＜1PPm,Co＜1PPm,Mn＜1PPm,Cr＜1PPm,Ti＜1PPm,V＜1PPm＜1PPm, Si≤0.1%.

Application: for all glass except the halide stream-based glass, the materials used in the laser crystal, laser ceramics materials.

Silicates List			
Chinese Name	英文名称（Product Name）	CAS No.	M.F
硅酸锂	Lithium silicate	10102-24-6	Li2O3Si
硅酸钙	Calcium silicate	1344-95-2	CaSiO3
硅酸镁	Magnesium silicate	1343-88-0	MgSiO3

Note: The optical level, total metal transition<10PPm.

Applications: mainly used in the manufacture of optical borosilicate glass, as ceramic materials additives.

Borate product catalog			
Chinese Name	英文名称（Product Name）	CAS No.	M.F
氧化硼	Boron oxide	1303-86-2	B2O3
三水偏硼酸钾	Potassium metborate	13709-94-9	K2B2O4.3H2O

Applications: mainly used in the manufacture of boron silicate optical glass, special glass auxiliary solvent, etc..

Applications of borate products

Boron oxide : Important part of the ingredients of the glass fiber-lower the glass melting temperature, thermal expansion coefficient, reduce the degree of crystallization, improve chemical stability of the glass, strengthen the strands of water resistance, chemical resistance, strengthening the adhesion ability of glass fiber and resin.Preparation of other boron compounds (e.g., boron carbide) of the starting material. Organic Synthesis acidic catalyst. Enamel, ceramic glaze fluxing agent. Liquid seal agent used in production of a semiconductor compounds (such as gallium arsenide, gallium phosphide, indium arsenide) .

Potassium Metaborate(3H2O) : Used as specialty glass and ceramic glaze co-solvents, welding material, additive, oil industry as catalyst, used as the nonlinear optical material.

Specification of optical grade fluorides

MgF2	Main content > 99% Fe < 10ppm Cu≤1ppm Co≤1ppm Cr ≤1ppm Mn≤1ppm Ni≤1ppm Pb≤1ppm LOI < 1.0%
CaF2	
SrF2	
BaF2	
A1F3	
LaF3	
LiF	
YF3	
ZnF2	

Potassium metaborate detection data

NO.	Test item	Technical requirement	Measured data
1	含量（K2B2O4+3H2O）	≥98.5	99.2
2	氧化硼(B2O3)，%	≥31.00	32.50
3	氧化钾(K2O)，%	≥42.00	43.75
4	铁(Fe)，%	≤0.005	0.0005
5	铅(Pb)，%	≤0.005	0.00012
6	氯化物(Cl)，%	≤0.05	0.0017
7	硫酸盐(SO4)，%	≤0.1	0.00048

Tritium breeder and nuclear fuel neutron reflector product material - International ThermonuclearExperimental Reactor

Introduction of International Thermonuclear Experimental Reactor:

The project of International Thermonuclear Experimental Reactor (ITER), currently is one of the world's largest and most influential international research cooperation project.The ITER device produces large-scale fusion reaction of superconducting , commonly knownas "artificial Sun". ITER has been initiated in 1985, and in 1988 the experimental reactor research and design work has started.

Units involved: Southwest Research Institute of nuclear industry, Hefei Institute of Physical Science(Chinese Academy of Sciences), Insititute of Nuclear Science and Technology (University of Science & Technology China) and so on.

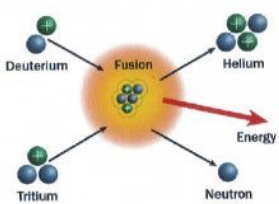
List of Tritium breeder and neutron reflector products

Chinese Product Name	Product Name	CAS	M.F	Purity
氟化铍	Berylium fluoride	7787-49-7	BeF2	99%、99.95%、99.99%
氟化锂	Lithium fluoride	7789-24-4	LiF	99%、99.95%、99.99%
正硅酸锂	Lithium orthosilicate	13453-84-4	Li4Si04	Customized
硅酸锂	Lithium silicate	10102-24-6	Li203Si	Customized
氧化镁	Magnesium oxide	1309-48-4	MgO	99%、99.9%、99.99%
氧化铍	Beryllium oxide	1304-56-9	BeO	99%、99.9%、99.95%

Breeder material:

①Liquid blanket breeder -FliBe molten salt (LiF-BeF2 lithium fluoride , beryllium).
Self-cooled lithium beryllium fluorine molten salt (FLiBe) proliferation cladding, both are proliferative agents and can make a coolant.

② Solid blanket breeder - lithium orthosilicate (Li4SiO4), lithium silicate (Li2O3Si), etc.
Lithium orthosilicate (Li4SiO4) because of containing a high amount of lithium , easy to achieve greater tritium breeding ratio, low neutron activation rate, comprehensive tritium performance and other advantages.Therefore, it is regarded as the preferred material for solid tritium breeder.



Neutron reflectors material:

MgO:Neutron reflectors nuclear fuel, moderator of an additive material.In order to efficiently make U235 fission, nuclear reaction easily, you must reduce the speed of neutrons in atomic reactors and add high-temperaturemoderator. Alternatively, it can be used as additive for beryllium oxide ceramic (dosage 0.5%)

Beryllium oxide: Used in some reactors as slow agent and the reflector. Nuclear fuel neutron reflectors, moderator .Also high purity beryllium oxide is the main raw material used for making nuclear purity grade beryllium oxide ceramics.

Tritium breeder and nuclear fuel neutron reflector product material - International ThermonuclearExperimental Reactor

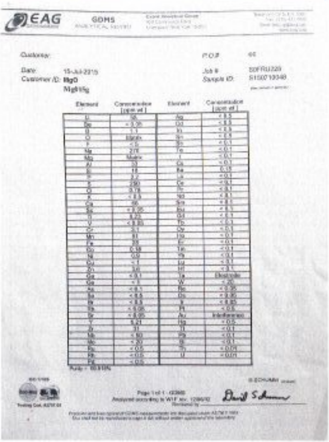
Beryllium fluoride single product test data: 99%

Product Name		Beryllium Fluoride	M.F		BeF2
Testing Device		ICP-AES	M.W		47.01
Quantity		10G	Purity		99.95%
No.	Test Items	Specification (%)	No.	Test Items	Specification (%)
1	Appearance	White or gray powder	13	Co	未检出
2	Purity	99.95%	14	Cu	0.07ppm
3	Be	17.64%	15	Mn	0.19ppm
4	Si	13.17ppm	16	Mo	0.07ppm
5	K	13.00ppm	17	Fe	5.81ppm
6	Na	未检出	18	Ni	0.09ppm
7	Al	14.22ppm	19	Pb	1.72ppm
8	Ca	39.45ppm	20	Cr	未检出
9	Mg	3.26ppm	21	Hg	未检出
10	Ba	2.44ppm	22	B	未检出
11	Zn	1.55ppm	23	Cd	0.06ppm
12	Li	0.14ppm			

Beryllium oxide product specifications and parameters: 99.95%

Name		Beryllium Oxide	M.F		BeO
Test Device		ICP-AES	M.W		25.01
Quantity		100G	Grade		High Purity
No.	Specification	Result	No.	Specification	Result
1	Appearance	White Powder	16	K	60
2	Purity	99.95%	17	Al	10
3	Impurity g/g	Maximum value	18	Ca	100
4	SO42-	100	19	Cr	30
5	PO43-	40	20	Ag	5
6	Cl	15	21	Hg	1
7	NH4+	20	22	B	1
8	Si	100	23	Cd	1
9	C	20	24	Mg	100
10	Mo	5	25	Ba	100
11	Fe	50	26	Zn	100
12	N	20	27	Co	5
13	Pb	20	28	Cu	10
14	C	50	29	Li	1
15	Na	40			

Magnesium Oxide Test Data Sheet: 99.9%



High purity beryllium oxide ceramics and special military materials - beryllium oxide

Beryllium and beryllium oxide belong to the national defense strategy material goods, which in the defense industry have a wide range of applications.Especially high purity beryllium oxide has had a great impact in development of specialty materials in the defense industry.

Beryllium oxide has been used as high thermal component part of the ceramic material. Beryllium oxide ceramics are widely used in special metallurgy, vacuum electronics technology, nuclear technology, microelectronics and optoelectronics fields.It has a wide range of applications,especially in high-power semiconductor devices, integrated circuits, microwave vacuum devices and nuclear reactors.

Domestic and foreign beryllium oxide technology

Berrylium oxide purity	China	Overseas
95%-99%	Common Berrylium oxide	
≥99.5%	Berrylium oxide ceramic grade	Common Berrylium oxide
≥99.9%	Shanghai TaiYang Technology Co.,Ltd.	Berrylium oxide ceramic grade
≥99.95%	Shanghai TaiYang Technology Co.,Ltd.	Restrictions to export to China

Note: because of the traditional domestic manufacturers with sulfuric acid and fluoride production method, beryllium oxide is generally not high.

Shanghai TaiYang Technology Co.,Ltd has developed unique purification process to produce ultra high purity beryllium oxide used in the production of nuclear material pure beryllium fluoride. The highest purity of Beryllium oxide can reach 99.95%. Measured data in the following table:

Product Name	Beryllia	氧化铍	BeO
Testing Device	ICP-AES	批号	20.01
Quantity	1000	Specifications	99.95%

No.	Parameter	Result	No.	Test Items	Specification (%)
1	Appearance	White Powder	11	Bi	0.05ppm
2	Al	5.00ppm	12	Cu	0.07ppm
3	Si	13.00ppm	13	Zn	1.55ppm
4	Fe	3.00ppm	14	Ni	0.92ppm
5	P	0.05ppm	15	Pb	1.72ppm
6	Mg	3.26ppm	16	Cr	未检出
7	Na	0.05ppm	17	Hg	未检出
8	Ca	7.50ppm	18	B	未检出
9	K	0.80ppm	19	Cd	0.40ppm
10	Mn	0.19ppm	20	Li	0.14ppm

Beryllium oxide purity alumina and silicon oxide with different content on the thermal conductivity of beryllia ceramics:The thermal conductivity decreased 20% (BeO ceramic =100%)

Impurity content	Alumina (Al2O3)	Silicon oxide(SiO2)
1%	7.9	14.8
2%	14.8	21.2
3%	21.2	38.0
4%	25.2	41.6
5%	34.0	52.0

The higher the thermal conductivity of Berrylium oxide, the better the performance of beryllium oxide ceramics. While preparing 99.95% high purity beryllium oxide for beryllium oxide ceramics, the thermal conductivity is increased by more than 28% while microwave dielectric loss reduced by 30%, significantly improving mechanical strength.

High purity beryllium oxide ceramics and special military materials - beryllium oxide

Beryllium oxide ceramics features

Beryllium oxide ceramics have the characteristics of high thermal conductivity, high melting point (2530 ± 10 ℃), high strength, high insulation resistance, high thermal conductivity, thermal stability, low dielectric constant, low dielectric loss and good process adaptability.

Beryllium oxide ceramic performance parameters

Purity, BeO(mass%)/%	99.5	99.98	150-400℃	8.1	<8.1
Bulk density/g/cm3	2.90	2.98	400-800℃	10.03	<10.03
Bending density/MPa	>160	>200	Compressive strength (50Hz) /kV/mm	14	18
Room temperature conductivity/W/m·K	240	270	Dielectric constant (100MHz) , ε r	6.8	2.04
CTE/10⁻⁶/℃			Dielectric loss (100MHz) , tg.δ	0.0001	<0.0001
20-100℃	4.6	<4.6			

Applications of Beryllium oxide ceramics

Industry(field of use)	Applications	Temperature	Requirements
Special metallurgy	Uranium melting crucible	>1130	High chemical stability
	Melting metals and high purityBe、Pt、Pd、Vcrucible	>1700	High chemical stability
Rockets,missiles	Engine combustion chamber,nozzles,shrouds	>2000	Termal shock resistant,corrosion resistance
MHD power generation	High temperature and high speed gas flow channel	>2000	High temperature corrosion resistance
Nuclear reactor project	Moderator	≥1000	Small neutron absorption cross section
	A reflective layer	≥1000	Resistant to radiation damage
	Nuclear fuel dispersant	≥1600	High temperature, high thermal conductivity small neutron capture area
Laser material	Berrylia laser	≥1600	High chemical stability, high temperature resistance, high heat conductivity
Electronic materials	Vacuum technology and electronics	≥1600	Highthermal conductivity and low dielectric constant
	High-power semiconductor devices, integrated circuits, microwave vacuum devices	≥1600	High flexural strength, thermal insulation

Applications of Beryllium oxide

Industry (field of use)	Applications	The purity requirements
Beryllium oxide ceramics	The main raw material for manufacturing berrylium oxide ceramics	99%、99.9%、99.95%
Atomic energy reactor engineering	Moderator, the reflectivelayer, the nuclear fuel	99.95%
Aerospace materials	High temperature, wear, corrosion-resistant, fire-resistant coating materials	99%、99.9%、99.95%
Optical material	Special optical glass, crystal materials additives	99.95%
Chemistry materials	For the manufacture of compounds of beryllium, dehydrogenation catalyst, phenol and pyridine absorber	99%、99.9%、99.95%

Molten salt reactor coolant temperature molten material - IV nuclear fisssion reactor

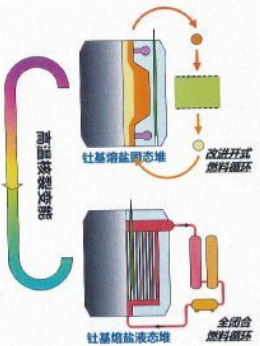
The fourth-generation molten salt reactors description

Molten Salt Reactor [molten salt reactor, MSR] is a nuclear fission reactor, in which the primary nuclear reactor coolant [primary coolant] is a molten salt mixture.MSRscan run a higher temperatures than water-cooled reactors for higher thermodynamic efficiency, while staying at low vapour pressure, thereby reducing mechanical stress, improving safety, and lower than the molten sodium coolant activity.

The nuclear fuel rods can be either solid or dissolved in the primary coolant itself, eliminating the need to manufacture fuel rods, to simplify the reaction Stack structure , uniform fuel consumption and allows online fuel reprocessing. Nuclear fuel is dissolved in molten fluoride salt coolant, as e.g.Uranium tetrafluoride (UF4) and other compounds. Molten salt reactor mixed fluoride-based coolant, works at normal pressure and ability to work at high temperatures. It should be power generation, nuclear energy utilization, the fourth generation of modular advanced reactor.

The main advantage is derived from the molten salt reactor coolant outstanding characteristics.

Units and projects related : the CAS Shanghai Institute of Applied Physics (TMSR thorium-based molten salt reactor) and similar ones.



Molten salt reactor fluoride product table

Chinese Product Name	英文名称 (Product Name)	CAS No.	M.F
氟化铍	Berylium fluoride	7787-49-7	BeF2
氟化锂	Lithium fluoride	7789-24-4	LiF
氟化钾	Potassium fluoride	7789-23-3	KF
氟化钠	Sodium Fluoride	7681-49-4	NaF
氟化锂(-7 丰度)	LiF(Li-7 abundance)		LiF(Li-7 abundance)

备注产品参数见附表。

Applications: Fluorine molten lithium beryllium (beryllium fluoride - lithium fluoride (-7 abundance)) as thecoolant of primary circuit, fluorine lithium, sodium and potassiumMolten salt (sodium fluoride - potassium fluoride - lithium fluoride) as a secondarycircuit coolant.

Beryllium fluoride-other applications

- For the manufacturing of beryllium metal and nuclear purity grade beryllium metal is used in the nuclear industry or other specialty industries.
- For laser glass fibers and waveguides.
- For the manufacture of KBBF group crystal (KBBF, CBBF, KABO, SBBO, RBBF, TBO crystals)
- For important key parts of machinery and equipment for metal surface passivation, such as rockets, tanks, planes, cars engines and other equipment, components, increased wear resistance, corrosion resistance, high temperature performance.

Beryllium Fluoride Specification : (Content of impurities(μg/g))

Impurities	Max	Impurities	Max	Impurities	Max
SO42-	100	NO3-	50	Mg	100
PO43-	40	Na	40	Ba	100
Cl	15	K	60	Zn	100
NH4+	20	Al	10	Co	5
Si	100	Ca	100	Cu	10
Mn	20	Cr	30	Li	1
Mo	5	Ag	5	Purity	>99.95%
Fe	50	Hg	1	Single rare earth	0.1
Ni	20	B	1	Total rare earth	1
Pb	20	Cd	1	water content	100

Lithium Fluoride (7-abundance) Specification: Content of impuritues (μg/g)

Impurities	Max	Impurities	Max	Impurities	Max
SO42-	100	NO3-	50	Mg	100
PO43-	40	Na	40	Ba	100
Cl	15	K	60	Zn	100
NH4+	20	Al	10	Co	5
Si	100	Ca	100	Cu	10
Mn	20	Cr	30	LiF -7abundance	>99.99%
Mo	5	Ag	5	Single rare earth	0.1
Fe	50	Hg	1	Total rare earth	1
Ni	20	B	1	water content	100
Pb	20	Cd	1		

Lithium Fluoride Specification : (Content of Impurities (μg/g))

Impurities	Max	Impurities	Max	Impurities	Max
SO42-	100	NO3-	30	Mg	100
PO43-	20	Na	40	Ba	100
Cl	100	Si	100	Al	100
Mn	20	Cr	30	LiF	≥99%
Ni	50	Ca	100	water content	1000
Fe	50	Pb	20		

Potassium Fluoride Specification : (Content of Impurities (μg/g))

Impurities	Max	Impurities	Max	Impurities	Max
SO42-	100	NO3-	30	Mg	100
PO43-	20	Na	40	Ba	100
Cl	100	Si	100	Al	100
Mn	20	Cr	30	KF	≥99%
Ni	50	Ca	100	water content	1000
Fe	50	Pb	20		

Sodium Fluoride Specification : (Content of Impurities (μg/g))

Impurities	Max	Impurities	Max	Impurities	Max
SO42-	100	NO3-	30	Mg	100
PO43-	20	Na	40	Ba	100
Cl	100	Si	100	Al	100
Mn	20	Cr	30	KF	≥99%
Ni	50	Ca	100	water content	1000
Fe	50	Pb	20		

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