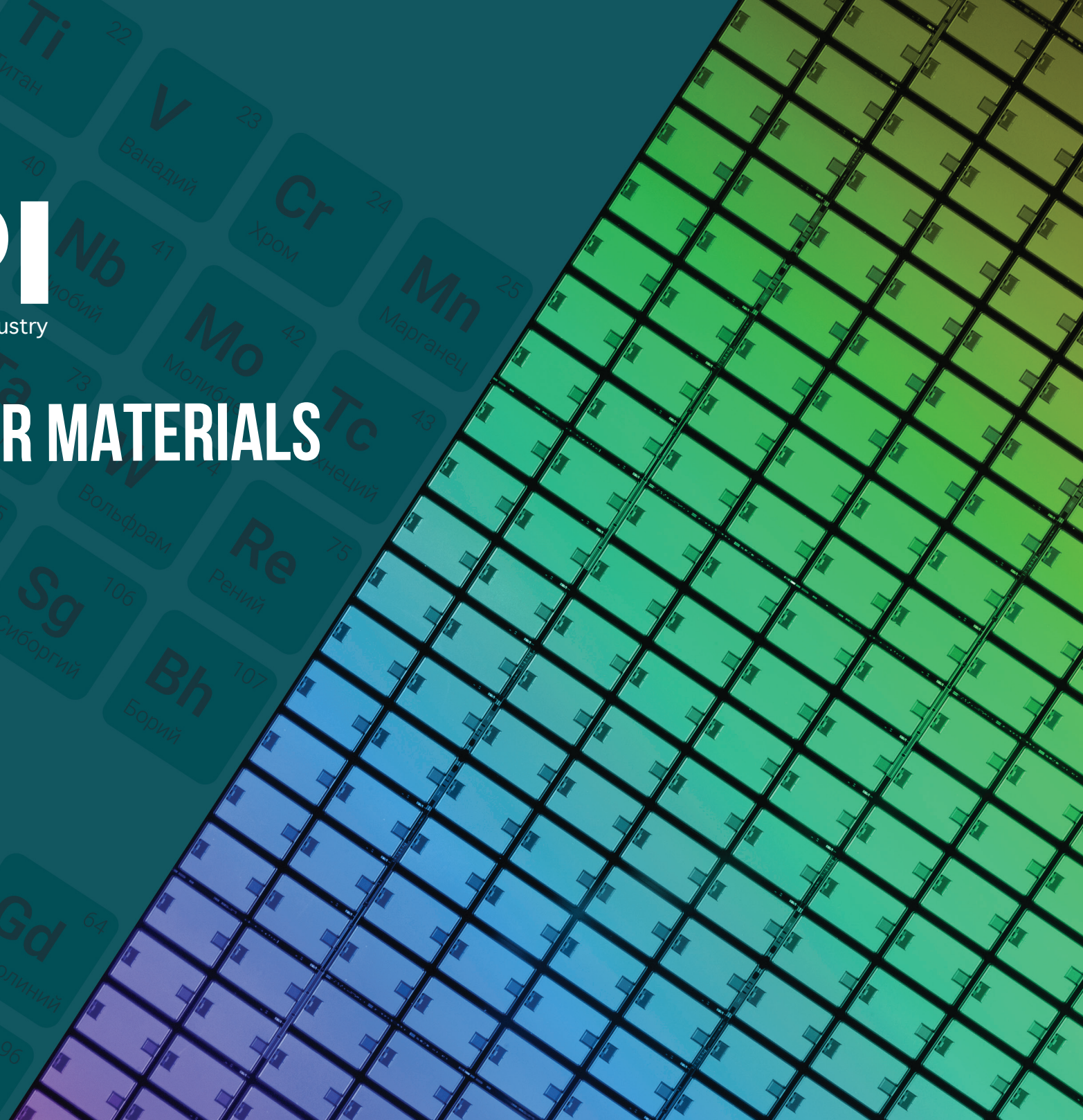
NPI
New Products Industry

SEMICONDUCTOR MATERIALS



Skolkovo

NPI New Products Industry

INTRODUCTION

«NPI» specializes in development and production of organometallic and organosilicon compounds, mainly used in the production of semiconductors. The main technological direction is the manufacturing of precursors used in ALD, CVD processes which are the most common in modern chip production.

Additional directions of synthesized products usage:

- Isotope production, volatile metal compounds used as working bodies in gas centrifuge enrichment.
- Optical fiber production. High-purity compounds used as starting material in the manufacture of optical fiber waveguides.
- Structural materials. Metal compounds used in chemical deposition technologies for creation of impervious coatings.

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R&D

The NPI Research Center

deals primarily with the development of precursors for chemical vapor deposition (CVD) and atomic layer deposition (ALD). We have around 40 highly qualified chemists in our laboratory who are ready to provide unique chemical synthesis according to the requirements.

Unique experience

in expanding production from laboratory to industrial scale.

NPI devotes a lot of resources to R&D direction

Thanks to dynamic research activities we maintain the consistently high level of chemical engineers' qualification. The list of compounds synthesized in the laboratory is being expanded and industrial synthesis and purification technologies are being improved regularly.

Continuous improving of the quality system

using the most effective methods of analytical control, involving standards that meet the certification requirements of the industry can guarantee consistently high quality of products and services provided by the company.

Synthesized

500 chemical compounds

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MANUFACTURING

NPI is focused on production of chemical compounds using a wide range of technologies, such as: methods of organic, inorganic, organometallic synthesis; operations with inert gas atmosphere; synthesis at low and high temperatures; reactions in liquid ammonia and organic solvents; using tribochemistry (ball and planetary mills); reactions under increased and decreased pressure.

Esteemed scientific consensus group from universities of Nizhny Novgorod and practical experience in industrial chemistry in Dzerzhinsk city allow us to use the full potential of our region. Our advantage is that we can build up the full production line from scientific research and laboratory samples to the production of semi-industrial series of chemical products. Collaborative activities with Dzerzhinsk chemical equipment manufacturers give us vast opportunities to manufacture non-series equipment for our projects in a short time.

Our specialists are qualified to manage with hazardous, flammable and explosive compounds; also with high purity (from 6N) substances, as well as to purify compounds to high degrees. For these purposes we use our own solutions in the field of rectification, such as: high and low temperature, usual and reduced pressure; sublimation purification, fractional distillation, fractional crystallization.

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QUALITY MANAGEMENT SYSTEM

Currently our specialists are analyzing the requirements of international standards in order to get the ISO certification in the field of design and development of methods of obtaining organometallic and organometallic compounds.

The company is also in process of preparing for certification in the area of design and manufacture of pilot production units and serial manufacturing.

We are already experienced in getting certification of QMS that meets the requirements of ISO 9001:2015 in the aviation sector, confirmed by a certificate of the Bureau of VERITAS.

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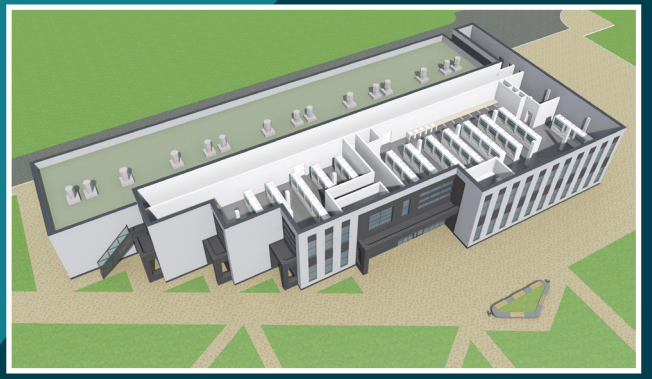
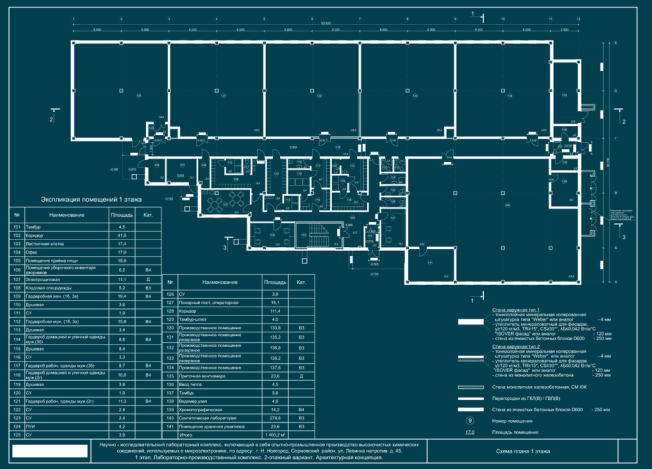
FOR INVESTORS

As part of increasing scientific and industrial activity, «NPI» company is engaged in the construction of a laboratory-industrial complex of high-purity chemical compounds.

At the moment we implement the construction of the first building which takes 3000 m2. It is supposed to contain synthetic and R&D laboratories, five production blocks, consumer premises and separate warehousing complex. At this step we are already able to provide the complete technological cycle from the development of new materials to their industrial production.

What is more, the territory of the project can accommodate up to 15.000m2 of similar laboratory and production space.





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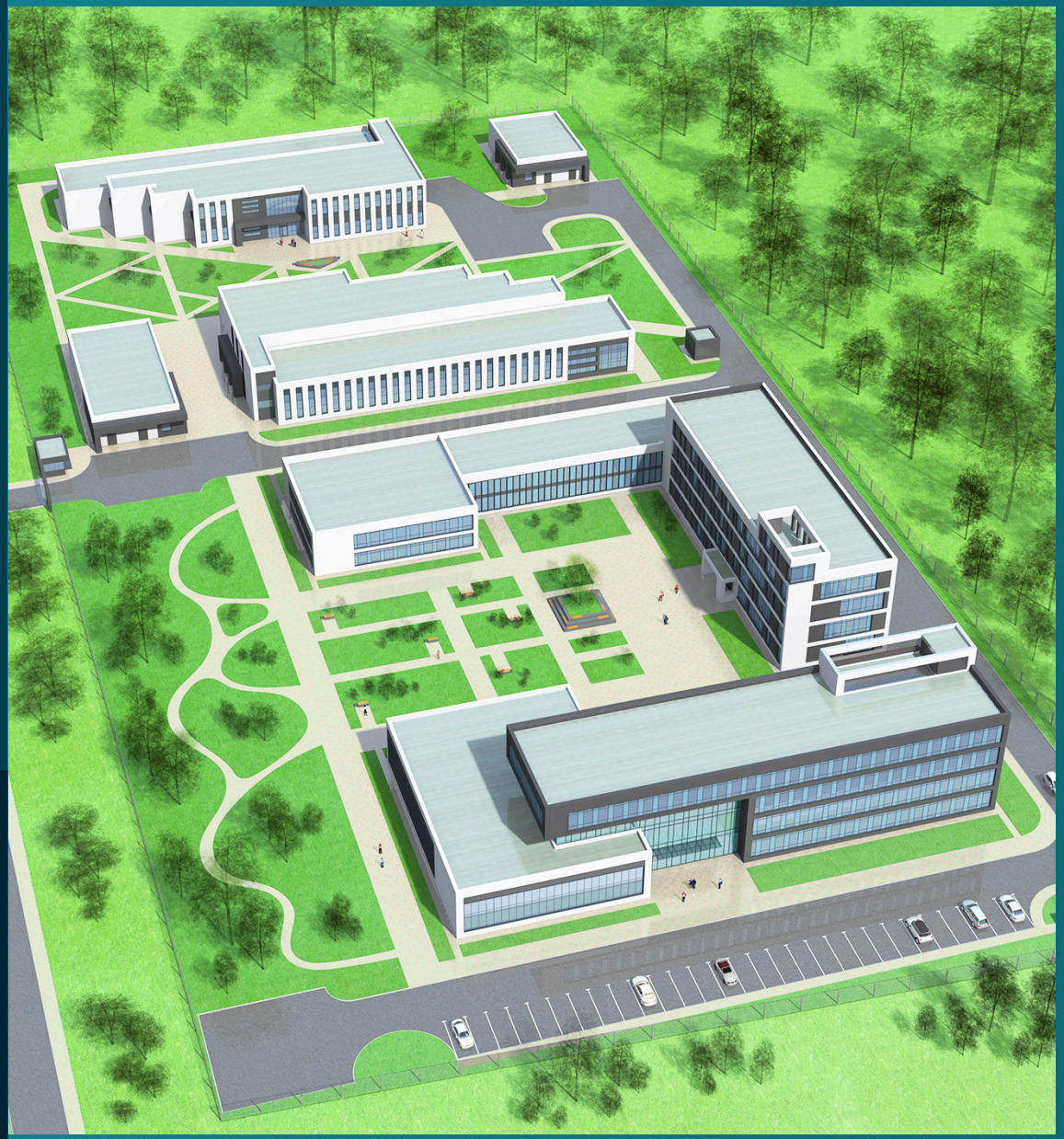

FOR INVESTORS

The complex will be located in Nizhny Novgorod, the city is admitted to be a capital of the chemical industry of Russia. The complex occupies the industrial zone on the outskirts of the city which makes it possible to attract employees from the best chemical scientific institutions.

The best research institutes and high schools in the field of chemistry, which are affiliated with the Russian Academy of Sciences, are concentrated in the city. Cooperating with them gives us access to the use of core research infrastructure centers, first of all analytical centers.

The company is a resident of the Skolkovo Innovation Fund, which allows to receive significant government support, including tax preferences.

There is a large amount of design organizations and manufacturers of unique chemical equipment which are concentrated in the region. This issue allows to create technological production lines with minimal financial and time expenses.

The presence of a strong chemical school in the region makes it possible to select employees with international-level qualifications at a wage rate significantly lower than in other countries. The complex will provide jobs for 300 chemical engineers.

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FOR INVESTORS

Comparatively low costs of infrastructure setup, availability of world-class technologies and highly qualified specialists, cheap energy resources and raw material base, as well as the tax-free status of the company - all these points extremely effect the cost of end products. Due these reasons the commercial offer is getting more competitive, the production - highly profitable, and the project itself is becoming attractive for investment.

For now we are looking for a strategic investor among large consumers and manufacturers of semiconductor materials, who have access to the market and are able to guarantee a stable sales of their products.

PRIME COSTS

Construction of permanent facilities including external systems	m2	1000-1500$
Average cost of technological equipment for laboratories	m2	1000-1500$
Average cost of commercial manufacturing	m2	1000-1500$
Chemists-engineer wages	monthly	1000-3000$
Income tax	%	0
Employee income tax	%	14

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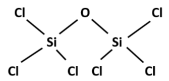
CATALOGUE

HCDSO (99.999% - Si)

Trichloro (trichlorosilyloxy) silane



Bulk request available

CAS Number
14986-21-1

IUPAC Name
Trichloro (trichlorosilyloxy) silane

Molecular Formula
Cl6OSi2

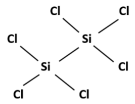
Average Mass
284.89

Form	Liquid
Appearance	Colorless
Assay (Purity)	99.8
Boiling Point	137 °C
Sensitivity	Moisture, air
Signal	Danger
Pictograms	

Hexachlorodisiloxane, Trichloro (trichlorosilyloxy) silane

HCDS (99.9999% - Si)

Hexachlorodisilane



Bulk request available

CAS Number
13465-77-5

IUPAC Name
Hexachlorodisilane

Molecular Formula
Si_2Cl_6

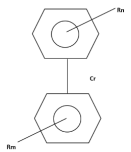
Average Mass
268.89

Form	Liquid
Appearance	Colorless
Assay (Purity)	99.8
Boiling Point	144.5 °C
Sensitivity	Moisture
Signal	Danger
Pictograms	

Hexachlorodisilane, Si_2Cl_6, Disilicon hexachloride, Perchlorodisilane

Bis(ethylbenzene)chromium

Bis(ethylbenzene)chromium (mixture of (C2H5)nC6H6-n, where n=0-4)



Bulk request available

CAS Number
12212-68-9

IUPAC Name
Bis(ethylbenzene)chromium (mixture of (C2H5)nC6H6-n, where n=0-4)

Molecular Formula
[(C2H5)nC6H6-n]2Cr

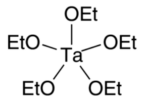
Average Mass
264.33

Form	Liquid
Appearance	Dark brown
Assay (Purity)	97
Boiling Point	140-160°C/2 mm Hg
Sensitivity	Air
Signal	Danger
Pictograms	

Chromium;ethylbenzene, Bis(ethylbenzene)chromium [mixture of (C2H5)nC6H6-n, where n = 0-4)]

Ta[EtO]5

Tantalum(V) ethoxide



Bulk request available

CAS Number
6074-84-6

IUPAC Name
Tantalum(V) ethoxide

Molecular Formula
C10H25O5Ta

Average Mass
406.26

Form	Liquid
Appearance	Colorless to yellow
Assay (Purity)	99
Boiling Point	145 °C/0.1 mm
Sensitivity	Moisture
Signal	Warning
Pictograms	

Tantalum(V) ethoxide, Ta(OC2H5)5, PET, Tantalum pentaethoxide, Tantalum(5+) pentaethanolate

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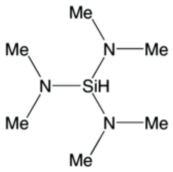
TDMAS (99.999% - Si)

N,N,N',N',N",N"-Hexamethylsilanetriamine



Bulk request available / LAB requests

CAS Number
15112-89-7

IUPAC Name
N,N,N',N',N",N"-Hexamethylsilanetriamine

Molecular Formula
[(CH3)2N]3SiH

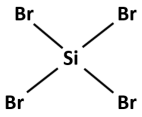
Average Mass
161.32

Form	Liquid
Appearance	Colorless to light yellow
Assay (Purity)	99.8
Boiling Point	145-148°C
Sensitivity	Moisture, air
Signal	Danger
Pictograms	

$[(CH_3)_2N]_3SiH$, Tris(dimethylamido)silane, N,N,N',N',N",N"-Hexamethylsilanetriamine

SiBr4 (99.9999% - Si)

Tetrabromosilane



Bulk request available

CAS Number
7789-66-4

IUPAC Name
Tetrabromosilane

Molecular Formula
SiBr4

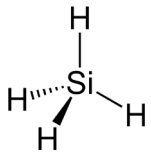
Average Mass
347.7

Form	Liquid
Appearance	Colorless
Assay (Purity)	99.9
Boiling Point	154 °C
Sensitivity	Moisture, light
Signal	Danger
Pictograms	

Silicon tetrabromide, Tetrabromosilane, Silicon(IV) bromide

^{28}SiH4 mono isotope (99,999% Si28)

Silane



CAS Number
7803-62-5

IUPAC Name
Silane

Molecular Formula
SiH4

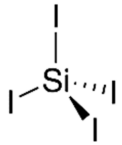
Average Mass
32.01

Form	Gas
Appearance	Colorless
Assay (Purity)	99
Boiling Point	-112.0°C
Sensitivity	Moisture, air
Signal	Danger
Pictograms	

Monosilane, silicane, silicon tetrahydride

SiI4 (99.999% - Si)

Silicon tetraiodide



Bulk request available

CAS Number
13465-84-4

IUPAC Name
Silicon tetraiodide

Molecular Formula
I4Si

Average Mass
535.7

Form	Powder
Appearance	Off-white
Assay (Purity)	99
Boiling Point	287.5°C
Sensitivity	Moisture, light
Signal	Danger
Pictograms	

Silicon(IV) iodide, silicon tetraiodide, tetraiodosilane

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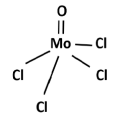
MoOCl4

Molybdenum(VI) tetrachloride oxide



Bulk request available

CAS Number
13814-75-0

IUPAC Name
Molybdenum(VI) tetrachloride oxide

Molecular Formula
MoOCl4

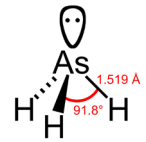
Average Mass
253.78

Form	Solid
Appearance	Green
Assay (Purity)	99
Boiling Point	-
Sensitivity	Moisture, air
Signal	Danger
Pictograms	

Molybdenum(VI) tetrachloride oxide, molybdenium(VI) oxotetrachloride, tetrachloridooxidomolybdenum(VI), Tetrachloro(oxo)molybdenum

AsH3

Arsine



Bulk request available

CAS Number
127323-69-7

IUPAC Name
Arsine

Molecular Formula
AsH3

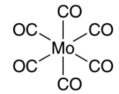
Average Mass
77.95

Form	Gas
Appearance	Colorless
Assay (Purity)	99
Boiling Point	-62.5
Sensitivity	Moisture, air
Signal	Danger
Pictograms	

Arsoniumyl, Arsenic trihydride(1+), Arsine, Radical ion(1+), Arsine(1+)

Mo(CO)6

Molybdenum hexacarbonyl



Bulk request available

CAS Number
13939-06-5

IUPAC Name
Molybdenum hexacarbonyl

Molecular Formula
C6MoO6

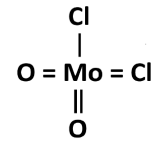
Average Mass
264.01

Form	Solid
Appearance	White
Assay (Purity)	99
Boiling Point	156 °C
Sensitivity	None
Signal	Danger
Pictograms	

Carbon monooxide - molybdenum (6:1), Hexacarbonylmolybdenum, Molybdenumhexacarbonyl

MoO2Cl2

Molybdenum(VI) dichloride dioxide



Bulk request available

CAS Number
13637-68-8

IUPAC Name
Molybdenum(VI) dichloride dioxide

Molecular Formula
MoO2Cl2

Average Mass
198.84

Form	Solid
Appearance	Yellow-Orange
Assay (Purity)	99
Boiling Point	-
Sensitivity	Moisture
Signal	Danger
Pictograms	

Dichlorodioxomolybdenum, Molybdenum dichloride dioxide

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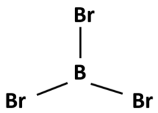
BBr3 (99.9999% - B)

Tribromoborane



Bulk request available

CAS Number
10294-33-4

IUPAC Name
Tribromoborane

Molecular Formula
BBr3

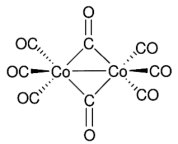
Average Mass
250.52

Form	Liquid
Appearance	Colorless to yellowish
Assay (Purity)	99
Boiling Point	91 °C
Sensitivity	Moisture, light
Signal	Danger
Pictograms	

Boron tribromide, Tribromoborane, Boron bromide

Co2(CO)8 (stabilized with 3-5% hexanes)

Dicobalt octacarbonyl



Bulk request available

CAS Number
10210-68-1

IUPAC Name
Dicobalt octacarbonyl

Molecular Formula
C8Co2O8

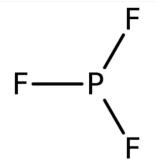
Average Mass
341.95

Form	Solid
Appearance	Dark-orange
Assay (Purity)	98
Boiling Point	52°C
Sensitivity	Air, store cold
Signal	Danger
Pictograms	

Dicobalt octacarbonyl, Carbon monooxide - cobalt (4:1), di-Cobalt octacarbonyl

PF3

Phosphorous trifluoride



Bulk request available

CAS Number
7783-55-3

IUPAC Name
Phosphorous trifluoride

Molecular Formula
PF3

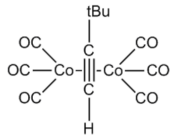
Average Mass
87.97

Form	Gas
Appearance	Colorless
Assay (Purity)	99
Boiling Point	−101.8 °C
Sensitivity	Moisture
Signal	Danger
Pictograms	

Trifluorophosphin, Phosphorous fluoride, Phosphorus trifluoride. trifluorophosphane.

CCTBA

3,3-Dimethyl-1-butyne)dicobalt hexacarbonyl



Bulk request available

CAS Number
56792-69-9

IUPAC Name
3,3-Dimethyl-1-butyne)dicobalt hexacarbonyl

Molecular Formula
C12H10Co2O6

Average Mass
368.07

Form	Liquid
Appearance	Dark red
Assay (Purity)	99
Boiling Point	52 °C/0.83 mm Hg
Sensitivity	Air
Signal	Danger
Pictograms	

Dicobalt Hexacarbonyl Tert-ButylAcetylene, 3,3-Dimethyl-1-butyne)dicobalt hexacarbonyl, Co2(CO)6[HC≡C(C(CH3)3)]

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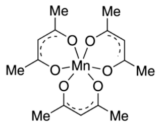
(Acac)3Mn

Manganese(III) acetylacetonate



Bulk request available

CAS Number
14284-89-0

IUPAC Name
Manganese(III) acetylacetonate

Molecular Formula
[Mn(C5H7O2)3]

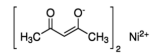
Average Mass
35217

Form	Solid
Appearance	Black powder or crystals
Assay (Purity)	98
Boiling Point	-
Sensitivity	Moisture
Signal	Warning
Pictograms	

Manganese(III) acetylacetonate, Manganese(III) 2,4-pentanedionate, Tris acetylacetonato manganese (III), Manganese(3+) tris[(2Z)-4-oxo-2-penten-2-olate]

(Acac)2Ni

Nickel(II) acetylacetonate



Bulk request available

CAS Number
3264-82-2

IUPAC Name
Nickel(II) acetylacetonate

Molecular Formula
Ni(C5H7O2)2

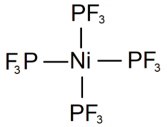
Average Mass
256.91

Form	Solid
Appearance	Light green powder or crystals
Assay (Purity)	98
Boiling Point	220°C
Sensitivity	Moisture
Signal	Danger
Pictograms	

Acetylacetonato nickel, Nickel acetylacetonate, Nickel acetonylacetonate, Bis(acetylacetone)nickel, Nickel(2+) bis[(2Z)-4-oxo-2-penten-2-olate]

Ni(PF3)4

Nickel trifluorophosphane



Bulk request available

CAS Number
13859-65-9

IUPAC Name
Nickel trifluorophosphane

Molecular Formula
Ni(PF3)4

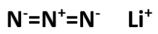
Average Mass
410.57

Form	Liquid
Appearance	Colorless
Assay (Purity)	99
Boiling Point	70.6°C
Sensitivity	Moisture
Signal	Danger
Pictograms	

Phosphorous trifluoride - nickel (4:1), Tetrakis(trifluorophosphine)nickel, $Ni(PF_3)_4$

LiN3 (20% in H2O)

Lithium azide



Bulk request available

CAS Number
19597-69-4

IUPAC Name
Lithium azide

Molecular Formula
LiN3

Average Mass
48.96

Form	Liquid
Appearance	Colorless
Assay (Purity)	99
Boiling Point	103°C
Sensitivity	Heat
Signal	Danger
Pictograms	

Lithium triazide, Lithium azide

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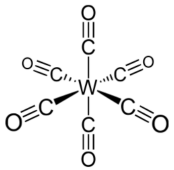
W(CO)6 (< 0.1% Mo)

Carbon monooxide - tungsten (6:1)



Bulk request available

CAS Number
14040-11-0

IUPAC Name
Carbon monooxide - tungsten (6:1)

Molecular Formula
W(CO)6

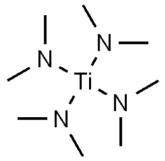
Average Mass
351.92

Form	Solid
Appearance	White
Assay (Purity)	99
Boiling Point	-
Sensitivity	Air, heat (decomposes at 200°C)
Signal	Warning
Pictograms	

Carbon monooxide - tungsten (6:1),Hexacarbonyl tungsten, Tungsten carbonyl

TDMAT

Titanium(IV) tetrakis (dimethylazanide)



Bulk request available

CAS Number
3275-24-9

IUPAC Name
Titanium(IV) tetrakis (dimethylazanide)

Molecular Formula
C8H24N4Ti

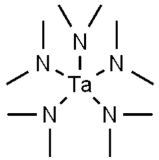
Average Mass
224.15

Form	Liquid
Appearance	Yellow to orange
Assay (Purity)	99
Boiling Point	50 °C/0.5 mm Hg
Sensitivity	Moisture, air
Signal	Danger
Pictograms	

Titanium(IV) tetrakis(dimethylazanide), Tetrakis(dimethylamido)titanium(IV),Ti $[N(CH_3)_2]_4$

PDMAT

Pentakis-(dimethylamino)-tantalum(V)



LAB requests

CAS Number
19824-59-0

IUPAC Name
Pentakis-(dimethylamino)-tantalum(V)

Molecular Formula
C10H30N5Ta

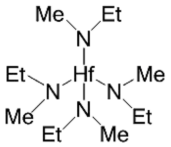
Average Mass
401.33

Form	Solid
Appearance	Orange
Assay (Purity)	99
Boiling Point	100°C/1 mm Hg
Sensitivity	Moisture
Signal	Danger
Pictograms	

(Tantalum(V) pentakis (dimethylazanide), Tantalum dimethylamide, TADMA, $Ta(NMe_2)_5$)

TEMAH

Hafnium tetrakis[ethyl(methyl)azanide]



LAB requests

CAS Number
352535-01-4

IUPAC Name
Hafnium tetrakis[ethyl(methyl)azanide]

Molecular Formula
C12H32HfN4

Average Mass
410.9

Form	Liquid
Appearance	Colorless to yellow
Assay (Purity)	99
Boiling Point	79 °C/0.1 mm
Sensitivity	Moisture
Signal	Danger
Pictograms	

Tetrakis(ethylmethylamido)hafnium(IV), Hafnium tetrakis[ethyl(methyl)azanide]

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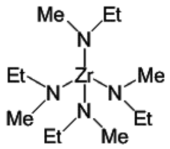
TEMAZ

Tetrakis(ethylmethylamino)zirconium(IV)



LAB requests

CAS Number
175923-04-3

IUPAC Name
Tetrakis(ethylmethylamino)zirconium(IV)

Molecular Formula
C12H32N4Zr

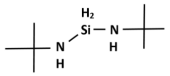
Average Mass
323.63

Form	Liquid
Appearance	Light yellow
Assay (Purity)	98
Boiling Point	81 °C / 0.1 mm Hg
Sensitivity	Moisture
Signal	Danger
Pictograms	

Tetrakis(ethylmethylamino)zirconium(IV), Zirconium(IV) tetrakis[ethyl(methyl)azanide], $Zr[N(CH_3)(CH_2CH_3)]_4$

BTBAS (99.999% - Si)

Bis(t-butylamino)silane



LAB requests

CAS Number
186598-40-3

IUPAC Name
Bis(t-butylamino)silane

Molecular Formula
C8H22N2Si

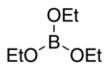
Average Mass
174.36

Form	Liquid
Appearance	Colorless
Assay (Purity)	99.8
Boiling Point	167 °C
Sensitivity	Moisture
Signal	Danger
Pictograms	

N,N' - bis (1,1-dimethylethyl) - , bis (tert-butylamino) silicon, Di(t-butylamino)silan

TEB

Triethyl borate



LAB requests

CAS Number
150-46-9

IUPAC Name
Triethyl borate

Molecular Formula
C6H15BO3

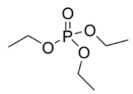
Average Mass
146

Form	Liquid
Appearance	Colorless
Assay (Purity)	99
Boiling Point	117.4°C
Sensitivity	Moisture
Signal	Danger
Pictograms	

Triethyl borate, Boron triethoxide, triethoxyborane, $B(OC_2H_5)_3$

TEPO

Triethyl phosphate



LAB requests

CAS Number
78-40-0

IUPAC Name
Triethyl phosphate

Molecular Formula
C6H15O4P

Average Mass
182.15

Form	Liquid
Appearance	Colorless
Assay (Purity)	98
Boiling Point	215 °C
Sensitivity	Moisture
Signal	Warning
Pictograms	

Triethoxyphosphine oxide, Tris(ethyl) phosphate, $((C_2H_5O)_3PO$

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