

edition

023



Nanomaterials and related products

catalogue & price-list

NanoDiamonds Fullerenes

Nanotubes

NanoGraphite

NanoMetals

NanoCeramics

NanoWires

Quantum Dots Ligands

Oligoglycines

Latexes

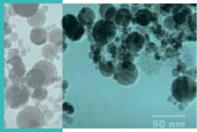
Monodisperse latexes

Piezoelectric nanoparticles Sensors: TDSP-stabilized

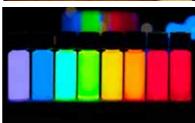
Au-nanoparticles

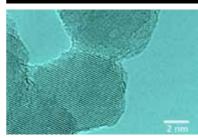












www.plasmachem.com



Dear Customer,

as a result of over 30 years experience in development, manufacturing and sales of nano-particles we are happy to present an updated issue of our general catalogue of nanomaterials and related products.

We provide a unified source of a wide range of materials which are mostly requested by researchers working in the nanotechnology area.

In this edition of the catalogue you will find newly introduced products - barium titanate piesoelectric nanoparticles, copper nanoparticles ink and new gold nanoparticles, which can be used in thermal sensing applications. We are also happy to introduce a new class of materials - polymeric monodisperse beads ranging from 0,25 μm to 10 μm .

Carsten Jost CEO



PlasmaChem GmbH Schwarzschildstr. 10 D-12489 Berlin, Germany Tel.: +49 30 63926313

Fax: +49 30 63926314 E-mail: shop@plasmachem.com Internet: shop.plasmachem.com

HRB 99010B VAT/USt. ID DE157830095 Customs number DE5479908

Content

	page
NanoDiamonds	4
Diamond Particles: from submicron to micron	6
Carbon nanoparticles (graphene, carbon nanotubes, fullerenes, graphite etc.)	7
Oxide Nanoparticles	9
Non-oxide Nanoparticles	19
Metal Nanoparticles	24
NanoWires	28
Salt Nano- and Microparticles	30
Quantum Dots, hydrophilic (for antibody/DNA labelling)	31
Quantum Dots, hydrophobic	35
Perovskite Quantum Dots, hydrophobic	40
Quantum Dots Kits	41
Metal-Organic Frameworks (MOF)	42
PEG Derivatives (for modification of surfaces and particles)	42
Tectomers (self-assembling oligopeptides)	43
Phosphonic Acids Derivatives (for surface modification and synthesis of particles)	44
Latex beads, monodisperse	46

NanoDiamonds

All types of nanodiamonds and nanographite / nanodiamonds mixtures are produced by controlled dry detonation synthesis followed by purification procedures.

We are ready to change product quality in case of special requirements.

Graphite / Diamond Nano-Mixture,

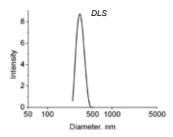
the most native, raw, just after detonation synthesis

Average diamond primary particle size: 4 nm

Diamond content: min. 20%

Ash content: < 6%

PL-GD-5g	5 g	35,00 EUR
PL-GD-25g	25 g	101,00 EUR
PL-GD-100g	100 g	361,00 EUR



Graphite / Diamond Nano-Mixture,

purified from metallic and organic impurities

Average diamond primary particle size: 4 nm

Diamond content: min. 20%

Ash content: < 0,3%

PL-GD-MOF-5g	5 g	59,00 EUR
PL-GD-MOF-25g	25 g	175,00 EUR
PL-GD-MOF-100g	100 g	602,00 EUR

NanoDiamonds, purified, grade G01

Enhanced suspension stability in water

Bulk density: 0,69 g/cm³

Specific surface (BET): min. 350 m²/g

Non-diamond carbon content: traces

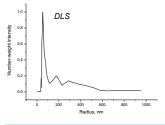
Ash content: <1.4%

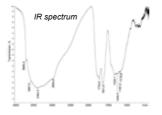
Losses at tempering: max. 2,4% Picnometric density: 3,18 g/cm³ Zeta potential: -50 ± 5 mV

Average cluster size: ca. 4 nm

Controlled admixtures, %: Fe < 0,3; Cu < 0,01; Zn < 0,01; Mn < 0,01; Si+Cr+Ca+Ti < 0,01

pK1	mmol/g	pK2	mmol/g	pK3	mmol/g	pK4	mmol/g	pK5	mmol/g	Total, mmol/g
3,7	0,09	4,5	0,19	6,6	0,1	8,5	0,14	9,9	0,1	0,62







PL-D-G01-1g	1 g	34,00 EUR
PL-D-G01-5g	5 g	125,00 EUR
PL-D-G01-25g	25 g	506,00 EUR
PL-D-G01-100g	100 g	1776,00 EUR

NanoPure-G01, nanodiamonds aqueous suspension, grade G01

4 wt.% aqueous suspension of nanodiamonds, type PL-D-G01.

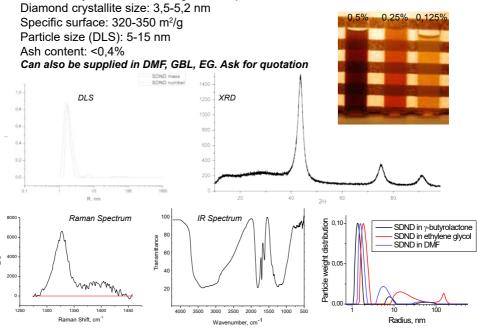
The nanodiamonds are preserved in the most dispersed form

PL-Nanopure-G01-10m	10 mL	22,00 EUR
PL-Nanopure-G01-50m	50 mL	89,00 EUR
PL-Nanopure-G01-100m	100 mL	125,00 EUR

Single-Digit NanoDiamonds (SDND)

Forms transparent stable colloidal solution of nanodiamonds in water and many polar organic solvents. Free of additives and milling impurities.

Produced by chemical desintegration. Aqueous 5% solution.



pK1	mmol/g	pK2	mmol/g	pK3	mmol/g	Sum amount groups, mmol/g
3,4	0,08	6,6	0,32	9,9	0,19	0,59

PL-SDND-5p-1g	20 mL	97,00 EUR
PL-SDND-5p-10g	200 mL	786,00 EUR
PL-SDND-5p-50g	1000 mL	3327,00 EUR

Nanodiamonds, positively charged, aq. suspension

Aqueous suspension of modified G01 nanodiamonds at 100mg/mL concentration. Nanodiamonds with the surface modified by polyelectrolyte electrostatic adsorption. Zeta potential: +50 ± 5 mV

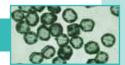
PL-D-G01P-10m	10 mL	38,00 EUR
PL-D-G01P-50m	50 mL	128,00 EUR

NanoDiamonds, extra-pure, grade G02

Ash content: < 0,1%

PL-D-G02-1g	1 g	95,00 EUR
PL-D-G02-10g	10 g	564,00 EUR

Diamond particles: from sub-micron to micron



Diamonds, 0 - 100 nm	PL-DD-01-0-1g	1 g (5 carat)	24,00 EUR
(grade 0.1/0)	PL-DD-01-0-5g	5 g (25 carat)	95,00 EUR
Diamonds, 0 - 250 nm	PL-DD-025-0-1g	1 g (5 carat)	24,00 EUR
(grade 0.25/0)	PL-DD-025-0-5g	5 g (25 carat)	95,00 EUR
Diamonds, 0 - 500 nm	PL-DD-05-0-1g	1 g (5 carat)	24,00 EUR
(grade 0.5/0)	PL-DD-05-0-5g	5 g (25 carat)	95,00 EUR
Diamondo 500 4000 mm	DL DD 4.05.4=	1 = (F ====t)	24.00 EUD
Diamonds, 500 - 1000 nm	PL-DD-1-05-1g	1 g (5 carat)	24,00 EUR
(grade 1/0.5)	PL-DD-1-05-5g	5 g (25 carat)	95,00 EUR
Diamonds, 10 - 14 µm	PL-DD-14-10-1g	1 g (5 carat)	24,00 EUR
(grade 1200 mesh)	PL-DD-14-10-5g	5 g (25 carat)	95,00 EUR
-	DI DD 440 00 4	4 (5 ()	04.00 5115
Diamonds, 80 - 110 μm	PL-DD-110-80-1g	1 g (5 carat)	24,00 EUR
(grade 140-170 mesh)	PL-DD-110-80-5g	5 g (25 carat)	95,00 EUR
Diamonds, 250 - 300 μm	PL-DD-300-250-1g	1 g (5 carat)	24,00 EUR
· · · · · · · · · · · · · · · · · · ·		- , ,	
(grade 50 - 60 mesh)	PL-DD-300-250-5g	5 g (25 carat)	95,00 EUR
Diamonds, 500 - 600 μm	PL-DD-600-500-1g	1 g (5 carat)	24,00 EUR
(grade 30-35 mesh)	J	- ,	,
(9.445 55 55 1116611)	PL-DD-600-500-5g	5 g (25 carat)	95,00 EUR

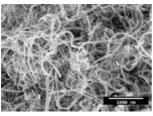
Carbon Nanoparticles, Graphene, Nanotubes, Fullerenes, etc.

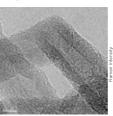
Carbon Nanotubes, multiwalled

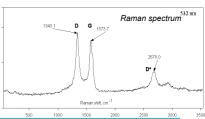
Carbon purity: min. 95% Number of walls: 3-15

Outer diameter: 5-20 nm; Inner diameter: 2-6 nm; Length: 1-10 μ m Apparent density: 0,15-0,35 g/cm³; Loose agglomerate size: 0,1-3 mm

Specific surface: ca. 240 m²/g







PL-MCNP-1g	1 g	23,00 EUR
PL-MCNP-10g	10 g	71,00 EUR
PL-MCNP-50g	50 g	265,00 EUR
PL-MCNP-100g	100 g	422,00 EUR

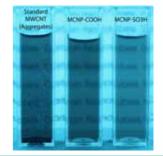
Carbon Nanotubes, multiwalled, charged, water soluble up to 30 μg/ml Carbon nanotubes (CNTs) type PL-MCNP, additionally modified by -COOH or -SO₃H groups. Soluble in water forming dark, transp. suspensions stable for many months. *Image: aq. suspensions of unstable unmodified (left) and stable modified CNTs*.

COOH- modified:

PL-MCNP-COOH-100mg	100 mg	59,00 EUR
PL-MCNP-COOH-500mg	500 mg	240,00 EUR
PL-MCNP-COOH-1g	1 g	349,00 EUR

SO₃H- modified:

PL-MCNP-SO3H-100mg	100 mg	59,00 EUR
PL-MCNP-SO3H-500mg	500 mg	240,00 EUR
PL-MCNP-SO3H-1g	1 g	349,00 EUR

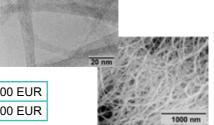


Carbon Nanotubes, single-walled

Produced by arc discharge method. SWCNTs assembled in bundles

Carbon purity: > 85%; Nanotube purity: > 74%; Diameter: ca. 1,5 nm

PL-SCNP-M-100mg	100 mg	109,00 EUR
PL-SCNP-M-500mg	500 mg	433,00 EUR



Graphene - nanoplatelets, dry

Thickness: 1-4 nm; Particles size: up to 2 µm

Specific surface area: 700-800 m²/g

Purity: 91 at.%. Other elements: O < 7 at.%; N < 2 at.%

PL-P-G750-1g	1 g	23,00 EUR
PL-P-G750-10g	10 g	119,00 EUR
PL-P-G750-50g	50 g	228,00 EUR

Graphene Oxide - aqueous dispersion

Thickness: 0,8-1,2 nm; Particles lateral size: 5-30 µm

4 mg/mL suspension in water; pH: ca. 6-7

C: 40-48%; O: 42-49 %; H: 1-4%; S: < 2%; N: < 1%

PL-GO-04p-10mL	10 mL	23,00 EUR
PL-GO-04p-25mL	25 mL	47,00 EUR
PL-GO-04p-100mL	100 mL	119,00 EUR

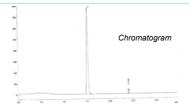
Carbon Black nanopowder

The finest analogue of industrially used filler for polymer composites Average particle size: ca. 13 nm; Specific surface: ca. 550 m²/g Ash content: < 0,02%; Bulk density: ca. 120 g/L

PL-CB13-50g	50 g	57,00 EUR
PL-CB13-200g	200 g	176,00 EUR

Fullerene C60, 99.5+%

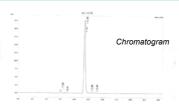
Time	Name	Volume, %
7,557	C60	99,956
11,873	C70	0,044
-	Others	0,000



PL-1C60-250mg	250 mg	49,00 EUR
PL-1C60-500mg	500 mg	79,00 EUR
PL-1C60-1g	1 g	139,00 EUR

Fullerene C70, 99+%

Time	Name	Volume, %
7,60	C60	0,07
11,85	C70	99,91
	Others	0,002



PL-1C70-10mg	10 mg	37,00 EUR
PL-1C70-50mg	50 mg	61,00 EUR
PL-1C70-200mg	200 mg	194,00 EUR

Oxide Nanoparticles

Along with the listed NanoCeramics many other ceramics were produced as trial batches. We are expecting here the specific wishes from our customers.

Aluminium oxide

Al₂O₃ - Nanopowder, alpha-phase

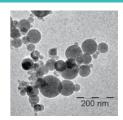
Particle shape: spherical

Average particle size: ca. 40 nm; Full range: 5 - 150 nm

Specific surface: > 10 m²/g

Purity: > 99,8%; X-Ray analysis: >90% α -Al₂O₃

PL-A-AIO-10g	10 g	22,00 EUR
PL-A-AIO-50g	50 g	68,00 EUR
PL-A-AIO-100g	100 g	115,00 EUR



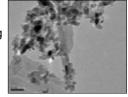
Al₂O₃ - Nanopowder, gamma

Particle shape: spherical, elongated

Average particle size: ca. 40 nm; Specific surface: > 40 m²/g

Purity: > 99,9%; X-Ray analysis: γ-Al₂O₃

PL-G-AIO-10g	10 g	19,00 EUR
PL-G-AIO-50g	50 g	82,00 EUR
PL-G-AIO-100g	100 g	119,00 EUR



Al₂O₃ - Nanopowder, theta Specific surface area: ca. 100 m²/g

Specific surface area: ca. 100 m²/g Average particle size (BET): ca. 15 nm

Purity: > 99,8% (after ignition); Loss after ignition: <3%

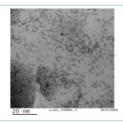
PL-T-AIO-10g	10 g	17,00 EUR
PL-T-AIO-50g	50 g	47,00 EUR
PL-T-AIO-100g	100 g	83,00 EUR

Cerium oxide

CeO₂ - Nanoparticles aqueous 5 wt.% suspension *Produced by chemical synthesis*

Average particle size: ca. 4 nm

PL-CeO-10g	200 mL	96,00 EUR
PL-CeO-50g	1000 mL	336,00 EUR



Copper oxide

CuO - Nanoparticles powder

Purity: >99%

Average particle size: ca. 40 nm; Particle shape: spherical Specific surface: > 10 m²/g; Bulk density: ca. 0,8 g/cm³

PL-CuO-10g	10 g	36,00 EUR
PL-CuO-50g	50 g	117,00 EUR

Indium oxide

In₂O₃ - Nanopowder

Produced by chemical synthesis

Average particle size: ca. 4 nm

PL-InO-10g	10 g	199,00 EUR
PL-InO-25g	25 g	467,00 EUR
PL-InO-50g	50 g	859,00 EUR
PL-InO-100g	100 g	1621,00 EUR

Iron (II,III) oxide

Fe₃O₄ - Nanoparticles aqueous suspension, magnetic fluid

ca. 300 Gauss, aqueous suspension. Superparamagnetic.

Contains ca. 3% of stabilizer (oleic acid)

Average particle size: 8 nm

Concentration: ca. 7 vol.% (ca. 30 wt.%)

PL-M-Fe3O4-10m	10 mL	72,00 EUR
----------------	-------	-----------

Fe₃O₄ - Nanoparticles aqueous suspension, magnetic fluid,

Without organic stabilizers. Superparamagnetic.
Excellent for L-b-L, LB coatings and for experiments where absence of organic stabilizer is desirable.

where absence of organic stabilizer is desirable. Average particle size: 8±3 nm. Concentration: ca. 3%

PL-A-Fe3O4-10m	10 mL	62,00 EUR
----------------	-------	-----------

Fe₃O₄ - Nanoparticles aqueous suspension, magnetic fluid, Without organic stabilizers

Dispersed in water at 3 wt.%; Average particle size: ca. 40 nm Can be concentrated or removed by magnet or sedimentation

PL-A-Fe3O4-B-10m	10 mL	73,00 EUR
------------------	-------	-----------

Iron (III) oxide

Fe₂O₃ - Nanoparticles aqueous suspension

Produced by chemical synthesis
Average particle size: 4-8 nm

Supplied as 5% aqueous suspension

PL-FeO-10g	200 mL	59,00 EUR
PL-FeO-50g	1000 mL	224,00 EUR



50 nm

Magnesium Oxide

MgO - Nanopowder

Primary particle average size: ca. 20 nm; Specific surface: ca. 50 m²/g; Purity: > 99%





78,00 EUR

PL-MgO-25g

25 g

Silicon dioxide

SiO₂ - Fumed silica, nanopowder, hydrophilic

Primary particle average size: 7-14 nm

Specific surface: > 200 m²/g Bulk Density: ca. 0,048 g/cm³

Purity: > 99,8% (excl. ca. 2% moisture)

PL-SiOF-25g 25 g 18,00 EUR

SiO₂ - Fumed silica, nanopowder, hydrophobic

Primary particle average size: ca. 14 nm

Specific surface: ca. 100 m²/g

Bulk Density: ca. 0,05 g/cm³; Purity: > 99,8% (excl. stabilizer)

Modified by polydimethylsiloxane (PDMS)

PL-SiOF-PDMS-25g 25 g 59,00 EUR

SiO₂ - Fumed silica, nanopowder, hydrophobic

Primary particle average size: 7-14 nm

Specific surface: ca. 150 m²/g

Bulk Density: ca. 0,05 g/cm³; Purity: > 99,8% (excl. stabilizer)

Modified by octylsilane

PL-SiOF-OS-25g 25 g 71,00 EUR

SiO₂ - Nanoparticles, 10 nm, 30% aq. suspension

Primary particle average size: ca.10 nm

Specific surface: ca. 320 m²/g Density: ca. 1,2 g/cm³;

Purity of solid component: > 99.5%

Admixtures: Na ca. 0,45%

PL-SiO10-30p-100m 100 mL 23,00 EUR

SiO₂ - Nanoparticles, 20 nm, aq. 50% suspension

Primary particle average size: ca.20 nm

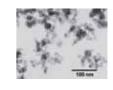
Specific surface: ca. 140 m²/g

Density: ca. 1,4 g/cm³;

Purity of solid component: > 99,5%

Admixtures: Na ca. 0.25%

PL-SiO20-50p-100m 100 mL 25,00 EUR









SiO₂ - monodisperse beads

Size 1: 0,25 µm

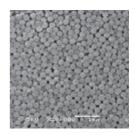
CV < 5%; 5 wt.% in water

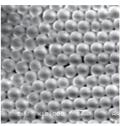
PL-SiO2-B-250-1m	1 mL	47,20 EUR
PL-SiO2-B-250-1m	5 mL	183,20 EUR



CV < 5%; 5 wt.% in water

PL-SiO2-3-B-5m	5 mL	60,00 EUR
PL-SiO2-3-B-10m	10 mL	112,00 EUR
PL-SiO2-3-B-20m	20 mL	200,00 EUR





Strontium oxide

SrO - Nanopowder

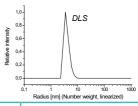
Produced by chemical synthesis
Average particle size: 200±50 nm

PL-SrO-1g	1 g	71,00 EUR
PL-SrO-10g	10 g	482,00 EUR

Tin oxide

SnO₂ - Nanoparticles aq. suspension, 5%

Produced by chemical synthesis Average particles size 4-8 nm Purity of dry component: min. 99,5%



PL-SnO-10g	200 mL	59,00 EUR
PL-SnO-50g	1000 mL	238,00 EUR

Titanium oxide

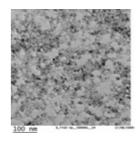
TiO₂ - Nanoparticles, dry powder anatase phase *Produced by chemical synthesis*

Average particle size: 4-8 nm

Loss on thempering (800 °C, 2 h): ca. 32% Dry nanopowder, free of organic stabilizers.

Easily forms colloidal solutions in water.

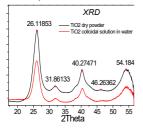
PL-TiO-NO-10g	10 g	55,00 EUR
PL-TiO-NO-50g	50 g	192,00 EUR

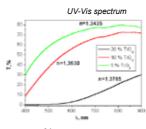


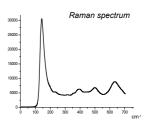
TiO₂ - Nanoparticles aqueous suspension, anatase phase

Produced by chemical synthesis Average particle size: 4-8 nm.

Aqueous colloidal solutions: 5, 10 or 20 wt.%







Aqueous colloidal solution, 5 wt.%

7 iquodub dolloluul dollull	511, O W. 70	
PL-TiO-5p-10g	200 mL	56,00 EUR
PL-TiO-5p-50g	1000 mL	210,00 EUR
Aqueous colloidal solution	on, 10 wt.%	
PL-TiO-10p-10g	100 mL	65,00 EUR
PL-TiO-10p-50g	500 mL	264,00 EUR
Aqueous colloidal solution, 20 wt.%		
PL-TiO-20p-10g	50 mL	77,00 EUR

TiO₂ - Nanoparticles, type P25

Photocatalytic standard P25.

PL-TiO-20p-50g

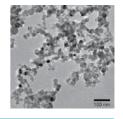
Dry Nanopowder. Mixed rutile / anatase phase

Average primary particle size: 21±5 nm.

Specific surface: 50±10 m²/g; Purity after ignition: >99,5%

250 mL

Ignition loss: < 2%; Moisture: < 1,5% Al_2O_3 < 0,3 wt.%; SiO_2 < 0,2 wt.% Tapped density: ca. 130 g/L



305,00 EUR

PL-TiO-P25-10g	10 g	23,00 EUR
PL-TiO-P25-50g	50 g	62,00 EUR

TiO₂ - Nanoparticles, type P25, hydrophobized

Dry Nanopowder. Mixed rutile / anatase phase, treated with octylsilane

Average primary particle size: 21±5 nm

Specific surface: 45±10 m²/g

Purity after ignition: TiO₂ > 97%; SiO₂ < 2,5 wt.%

Ignition loss: < 5%; Moisture: < 1%

C < 3.8 wt.%;

Tapped density: ca. 200 g/L

PL-TiO-P25-HPB-10g	10 g	31,00 EUR
PL-TiO-P25-HPB-50g	50 g	71,00 EUR

TiO₂ - Nanoparticles aqueous suspension, brookite/anatase

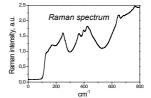
Average particle size: 2-5 nm.

Mixed brookite / anatase phase

Stabilized by tetramethylammonium hydroxide

Aqueous colloidal solution, 20 wt.%

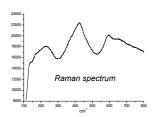
	, -	
PL-TiO-N-20p-15g	75 mL	107,00 EUR
PL-TiO-N-20p-50g	250 mL	299,00 EUR

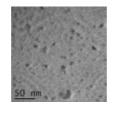


TiO₂ - Nanoparticles, rutile

Average particle size: 2±1 nm. Dry nanopowder.

Readily forms colloidal solutions in water (up to 900g/L) and methanol







PL-TiO-R-1g	1 g	41,00 EUR
PL-TiO-R-5g	5 g	95,00 EUR
PL-TiO-R-25g	25 g	346,00 EUR

TiO₂ - Nanoparticles, anatase, **hydrophobic**

Average particle size: 4-8 nm. Anatase phase.

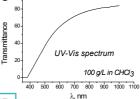
Stabilized by dodecylphosphonic

acid and hexylamine.

Forms transparent colloidal solutions in chloroform.

Supplied as a powder.

PL-TiO-HPBC-1g	1 g	44,00 EUR
PL-TiO-HPBC-10g	10 g	306,00 EUR



TiO₂ - Nanoparticles, anatase, **hydrophobic**

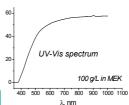
Average particle size: 4-8 nm. Anatase phase.

Stabilized by benzoic acid.

Forms transparent colloidal solutions in MEK (methylethylketone) and many epoxides.

Supplied as a 100 g/L solution in MEK

PL-TiO-HPBM-10p-1g	10 mL	41,00 EUR
PL-TiO-HPBM-10p-10g	100 mL	277,00 EUR



Fransmittance

TiO₂ - Nanorods, 1% aqueous solution Length: ca. 100 nm. Diameter: 20-40 nm

Stabilized only with citrate.

Phase: anatase

Supplied as a 1 wt.% aqueous solution

PL-TiONR-10m	10 mL	23,00 EUR
PL-TiONR-100m	100 mL	119,00 EUR



TiO₂ - Nanowires Length full range: 0,5-100 μm Diameter: 50-100 nm

Phase: anatase Dry powder





PL-TiOW50-100mg	100 mg	47,00 EUR
PL-TiOW50-500mg	500 mg	192,00 EUR
PL-TiOW50-1g	1 g	315,00 EUR

Tungsten (VI) oxide

WO₃ - Nanopowder

Average particles size: 100-200 nm

Purity: 99,9%

PL-WO200-5g	5 g	29,00 EUR
PL-WO200-25g	25 g	75,00 EUR
PL-WO200-100g	100 g	289,00 EUR

Yttrium oxide

Y₂O₃ - Nanopowder Average particles size: 30-50 nm

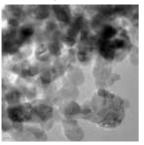
Specific surface area: ca. 40 m²/g

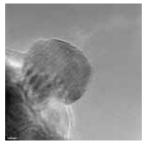
PL-P-Y2O3-5g	5 g	23,00 EUR
PL-P-Y2O3-25g	25 g	59,00 EUR
PL-P-Y2O3-100g	100 g	228,00 EUR

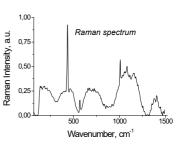
Zinc oxide

ZnO - Nanopowder, ca. 14 nm

Average particle size: ca. 14 nm; Specific surface area: 30±5 m²/g Purity: > 99%



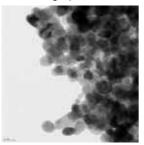


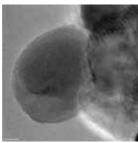


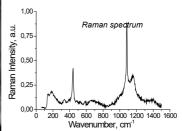
PL-ZnO14-5g	5 g	28,00 EUR
PL-ZnO14-25g	25 g	77,00 EUR
PL-ZnO14-100g	100 g	271,00 EUR

ZnO - Nanopowder, ca. 25 nm

Average particle size: ca. 25 nm; Specific surface area: 19±5 m²/g Purity: > 99%







PL-ZnO25-5g	5 g	25,00 EUR
PL-ZnO25-25g	25 g	72,00 EUR
PL-ZnO25-100g	100 g	252,00 EUR

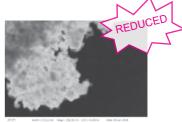
Zirconium oxide

ZrO₂ - Nanopowder, cubic

Stabilized with 6 mol% Y₂O₃

Average particle size: 20-50 nm; Shape: spherical. Particles are bound by necks forming aggregates. Cubic structure is due to the stabilizer and to the small particle size (size effect)

PL-D-C-ZrO-5g	5 g	35,00 EUR
PL-D-C-ZrO-25g	25 g	99,00 EUR
PL-D-C-ZrO-100g	100 g	149,00 EUR

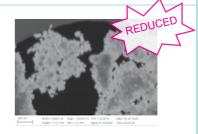




ZrO₂ - Nanopowder, tetragonal Stabilized with 6 mol% Y₂O₃;

Average particle size: 100-200 nm

PL-T-ZrO-5g	5 g	35,00 EUR
PL-T-ZrO-25g	25 g	99,00 EUR
PL-T-ZrO-100g	100 g	149,00 EUR



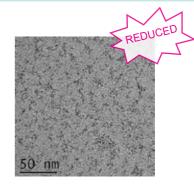
ZrO₂ - Nanopowder, monoclinic

Average particle size: 5-25 nm; Specific surface: 130±20 m²/g;

Purity: > 97,2%

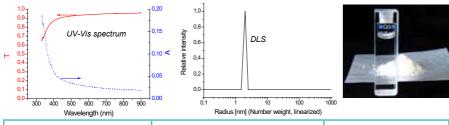
Controlled admixtures, %: Y₂O₃ < 0,018; Al₂O₃ < 0,24; SiO₂ < 0,15; HfO₂ < 1,91; TiO₂ < 0,42; Fe₂O₃ < 0,021

PL-M-ZrO-5g	5 g	20,00 EUR
PL-M-ZrO-25g	25 g	55,00 EUR
PL-M-ZrO-100g	100 g	99,00 EUR

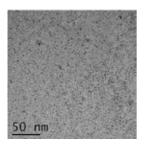


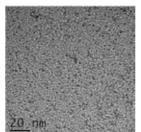
ZrO₂ - Nanopowder, **hydrophilic, forms colloidal solutions** Average particle size: ca. 3 nm

Forms stable colloidal solutions in water



PL-ZrO-HPL-1g	1 g	49,00 EUR
PL-ZrO-HPL-5g	5 g	129,00 EUR



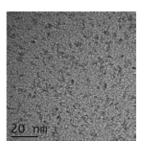


ZrO₂ - Nanopowder, **hydrophobic, forms colloidal solutions** Same as above, but additionally stabilized by benzoic acid.

Average particle size: ca. 3 nm

Forms stable colloidal solutions in MEK and epoxides

PL-ZrO-l	HPB-1g	1 g	61,00 EUR
PL-ZrO-l	HPB-5g	5 g	228,00 EUR



Non-oxide Nanoparticles

Along with the listed NanoCeramics many other ceramics were produced as trial batches. Basic technology permits to produce nearly any ceramic in nanosized form, thus we are expecting here the concrete wishes from our customers.

Aluminium Nitride

AIN - Nanopowder

Particle shape: spherical, hexagonal,

polyhedronal, fragmental

Particle size full range: 5 - 200 nm Average particle size: 25 - 50 nm Specific surface: > 18 m²/g Bulk density: 0,16 - 0,28 g/cm³

Purity: > 95,0%

Controlled admixtures, %: Mg < 0,03; Na < 0,03; Fe < 0,1; Cu < 0,4; W < 0,2;

Al (free) < 2,4

X-Ray analysis: 96 % of hexagonal, lattice parameters: a = 3,114Å, c = 4,986Å

PL-PJ-AIN-5g	5 g	23,00 EUR
PL-PJ-AIN-25g	25 g	71,00 EUR
PL-PJ-AIN-100g	100 g	259,00 EUR

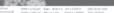
Boron Carbide

B₄C - Nanopowder

Particle size: ca. 60 nm Purity > 99,5 % Controlled admixtures: Fe 0.0001 %, Ni 0.0002 %, Al 0.0002 %, O < 0.08 %,

free carbon 0.002 %







Seve . WHEN-BILLIAM MAN-ISLEEK DYT-SCOON CHIK-OS IN-SCEE

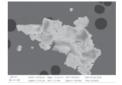
PL-SS-B4C-5g	5 g	57,00 EUR
PL-SS-B4C-25g	25 g	192,00 EUR
PL-SS-B4C-100g	100 g	572,00 EUR

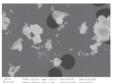
Boron Nitride, cubic

BN - Nanopowder

Particle size full range: 80-450 nm Average particle size: 165±15 nm Specific surface: > 11 m²/g Content of cubic phase: > 99,0%

Controlled admixtures, %: Mg < 0,35; Si < 0,14; Fe < 0,04; Ca < 0,03; Cr < 0,03





PL-IS-CBN-5g	5 g	51,00 EUR
PL-IS-CBN-25g	25 g	205,00 EUR
PL-IS-CBN-100g	100 g	723,00 EUR

Boron Nitride, hexagonal

BN - Nanopowder

Particle size full range: 100-10000 nm

Average particle size from BET: 130 nm; D50: 2µm

Specific surface: 20 ± 3 m²/g

Purity: > 98,5%; Nitrogen content > 55%

Controlled admixtures, %: O < 1,2; C < 0,1; B_2O_3 < 0,2



PL-H-HBN-5g	5 g	29,00 EUR
PL-H-HBN-25g	25 g	65,00 EUR
PL-H-HBN-100g	100 g	144,00 EUR

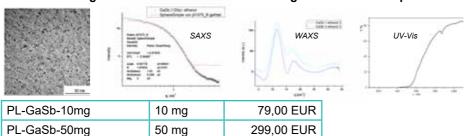
Gallium Antimonide, hydrophobic

GaSb - Nanopowder

Average particle size: 4 nm

Forms clear colloidal solutions in ethanol and non-polar solvents.

GaSb has highest known refractive index among non-metallic compounds



Gallium Arsenide, hydrophobic

GaAs - Nanopowder

Average particle size: 4 nm

Forms clear colloidal solutions in non-polar solvents

PL-GaAs-10mg	10 mg	79,00 EUR
PL-GaAs-50mg	50 mg	299,00 EUR

Silicon Carbide / Silicon Nitride

SiC - Nanopowder

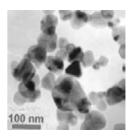
Average particle size: 20±7 nm. Cubic phase.

Specific surface: 80 ± 7 m²/g

Purity: > 98,0%

C(free) < 0,75; Si(free) < 0,25; O < 1,25; Cl < 0,25

- ()	-,,,	,,
PL-HK-SiC-5g	5 g	38,00 EUR
PL-HK-SiC-25g	25 g	118,00 EUR
PL-HK-SiC-100g	100 g	398,00 EUR



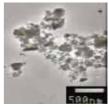
SiC - Nanopowder

Shape: cubic, hexagonal, fragmental, single fibers

Particle size full range: 5 - 250 nm Average particle size: 25 - 50 nm Specific surface: > 18 m²/g Bulk density: 0,23 - 0,35 g/cm³

Hexagonal, 98%, (a = 3,082 Å, b = 3,082 Å, c = 15,1006 Å) Hexagonal, 2%, (a = 3,082 Å, b = 3,082 Å, c = 37,70 Å)

Purity: > 98,6%; Al < 0,03; Mg < 0,03; Na < 0,03; Fe < 0,1; Cu < 0,4; W < 0,2%



PL-PJ-SiC-5g	5 g	35,00 EUR
PL-PJ-SiC-25g	25 g	90,00 EUR
PL-PJ-SiC-100g	100 g	307,00 EUR

Si₃N₄ - Nanopowder

Average particle size: 25±5 nm Specific surface area: 75±5 m²/g

Controlled admixtures, %: Fe < 0,05; Ca < 0,05; Al < 0,1

PL-N-SiN-5g	5 g	39,00 EUR
PL-N-SiN-25g	25 g	118,00 EUR
PL-N-SiN-100g	100 g	398,00 EUR

Titanium Boride

TiB_a - Nanopowder

Purity: > 98,5%

Particle size: D90 < 1µm

Controlled admixtures, %: $B_2O_2 < 0.1$; C < 0.3; Fe < 0.1; Si < 0.2

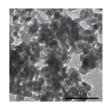
PL-A-TiB-5g	5 g	37,00 EUR
PL-A-TiB-25g	25 g	113,00 EUR
PL-A-TiB-100g	100 g	398,00 EUR

Titanium Nitride

TiN - Nanopowder

Average particle size: 50±5 nm; Specific surface area: 22±5 m²/g X-ray analysis: cubic phase > 99% Fe < 0,1; Si < 0,05; Ni < 0,1

PL-N-TiN-5g	5 g	35,00 EUR
PL-N-TiN-25g	25 g	106,00 EUR
PL-N-TiN-100g	100 g	388,00 EUR



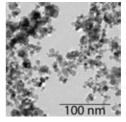
TiN - Nanopowder

Average particle size: 20±5 nm; Specific surface area: 80±5 m²/g X-ray analysis: cubic phase > 97%

O < 3; C < 0.1; Fe < 0.02

Forms dark transparent stable colloidal

suspensions in water





PL-HK-TiN-5g	5 g	38,00 EUR
PL-HK-TiN-25g	25 g	118,00 EUR
PL-HK-TiN-100g	100 g	398,00 EUR

Non-oxide Nanoparticles Blends

Composite ceramics based on this mixture have the highest armour properties, the powder can be used in other composites for their wear resistance increase.

Titanium Boride - Boron Carbide

TiB₂ / B₄C (20 / 80)- Nanopowder mixture

Composition: $TiB_2 > 19,7\%$; $B_4C > 77\%$

Controlled admixtures, %: $B_2O_3 < 0.18$; C < 2,46; Fe < 0,02; Si < 0,04

PL-A-BCTB-5g	5 g	36,00 EUR
PL-A-BCTB-25g	25 g	106,00 EUR
PL-A-BCTB-100g	100 g	375,00 EUR

Titanium Boride - Boron Carbide - Tungsten Boride

TiB $_2$ / B $_4$ C / W $_2$ B $_5$ (30 / 10 / 60)- Nanopowder mixture Composition: W $_2$ B $_5$ > 59,4%; TiB $_2$ > 29,5%; B $_4$ C > 9,6%

Controlled admixtures, %: $B_2O_3 < 0.11$; C < 0.45; Fe < 0.1; Si < 0.15

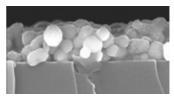
PL-A-WTB-5g	5 g	40,00 EUR
PL-A-WTB-25g	25 g	119,00 EUR
PL-A-WTB-100g	100 g	422,00 EUR

Metal Nanoparticles

Along with listed NanoMetals, many other metals were produced as trial batches in nanosized form, e.g. Stainless steel, Sn, Mn, Rare Earth Metals, W, Mo, V, Ag, Pt, Ir, Au. The same as in case of NanoCeramics, we are ready to produce almost any nanometal, also from material of customers.

Copper

Cu - nanopowder, ca. 100 nm Average particle size: 100 ± 5 nm



PL-Cu-T100-5g	5 g	39,00 EUR
PL-Cu-T100-25g	25 g	149,00 EUR
PL-Cu-T100-100g	100 g	449,00 EUR

Cu - nanopowder, ca. 20 nm

Average particle size: 20 ± 10 nm

Metal purity >99%

Admixture: <0,2% benzotriazole as surface stabilizer

PL-Cu-M20-25g	25 g	190,00 EUR
---------------	------	------------

Cu - nanoparticles, aqueous dispersion

Stabilized with polyacrylic acid Average particle size: 70 ± 20 nm Can be used as a catalyst layer for

electroless deposition of conductive coatings.



PL-CuPAA3-25m	3 wt.% Cu	25 mL	45,00 EUR
PL-CuPAA3-100m	3 wt.% Cu	100 mL	150,00 EUR
PL-CuPAA10-25m	10 wt.% Cu	25 mL	120,00 EUR
PL-CuPAA10-100m	10 wt.% Cu	100 mL	400,00 EUR

Copper-Tin alloy (90:10)

Purity: > 97%

Particle shape: spheric

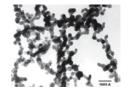
Average particle size: 70 - 80 nm. Particle size full range: 5 - 250 nm

Specific surface area: > 10 m²/g

Bulk density: > 0,8 g/cm³

Controlled admixtures, %: Fe < 0,1; W < 0,2

PL-CuSn-5g	5 g	119,00 EUR
PL-CuSn-25g	25 g	422,00 EUR



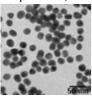
Gold

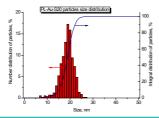
Au - Nanoparticles, aqueous colloidal solution

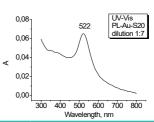
Colloidal solution in water, 0,05 mg/mL

Average particle size: 20±3 nm (other sizes available upon request)

pH ca. 8,0







PL-Au-S20-05mg	10 mL	21,00 EUR
PL-Au-S20-5mg	100 mL	96,00 EUR

Au - dry nanopowder, hydrophobic

Forms colloidal solutions in non-polar solvents.

Monodisperse nanoparticles, can be used for 2-D and 3-D structures build-up.

Average particle size: ca. 2 nm

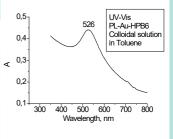
PL-Au-HPB2-10mg	10 mg	79,00 EUR
PL-Au-HPB2-50mg	50 mg	210,00 EUR

Average particle size: ca. 4 nm.

PL-Au-HPB4-10mg	10 mg	72,00 EUR
PL-Au-HPB4-50mg	50 mg	210,00 EUR

Average particle size: 6-7 nm.

PL-Au-HPB6-10mg	10 mg	72,00 EUR
PL-Au-HPB6-50mg	50 mg	210,00 EUR



Au - nanoparticles, stabilized with tannic acid

Au concentration: 0,05 mg/mL (corresponds to 0,01% $\rm HAuCl_4$), aq. solution Admixtures, %: tannic acid < 0,01; sodium citrate < 0,04

PL-Au-TAN4-25m	Average Particle size 3-4 nm	25 mL	67,00 EUR
PL-Au-TAN7-25m	Average Particle size 7-8 nm	25 mL	67,00 EUR
PL-Au-TAN14-25m	Average Particle size 13-15 nm	25 mL	67,00 EUR

Au - nanoparticles, 50 nm, 500 ppm in water

Au concentration: 5 mg/mL, aq. solution Admixtures: citrate, cell-culture bovine gelatine

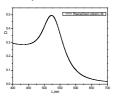
PL-Au50-05p-1m	1 mL	121,00 EUR
PL-Au50-05p-10m	10 mL	544,00 EUR

Au - nanoparticles, aqueous colloidal solution, TDSP stabilized

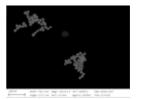
Au concentration*: 0.6 ± 0.1 mg/mL (higher Au-concentrations available upon request) (*Au concentration in colloid according to extractive photometric determination with 1-(2,4,6-trichlorophenyl)-4,4,6-trimethyl-(1H,4H)-2-Pyrimidinethiol, see M. A. ANUSE et al., Talanta. Vol. 32, No. 10, pp. 1008-1010, 1985)

Optical density at maximum, after dilution x 30 times: 0.5 ± 0.01

Particle size, average (TEM): 14±3 nm Absorption maximum position: 524 nm ± 2 nm







PL-Au-NL-10m	10 mL	65,00 EUR
PL-Au-NL-100m	100 mL	319,00 EUR

Fe - Nanopowder with hydrophobic carbon shell

Purity: > 97,0% Particle shape: spherical

Average particle size: 30 - 60 nm

Fe-state: ferromagnetic

Particle size full range: 5 - 200 nm

Specific surface area: > 12 m²/g

Bulk density: > 0,5 g/cm³

Controlled admixtures %: Cu<0,4; W<0,2 C-content: 11-14%

PL-HPB-Fe-5g	5 g	74,00 EUR
PL-HPB-Fe-25g	25 g	259,00 EUR

Nickel

Ni - nanopowder

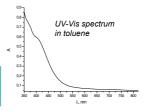
Average particle size: ca. 50 nm.

PL-Ni50-1g	1 g	47,00 EUR
PL-Ni50-5g	5 g	119,00 EUR

Palladium Nanoparticles, hydrophobic

Average particle size: ca. 6-7 nm. Form colloidal solutions in non-polar solvents. Monodisperse nanoparticles, can be used for 2-D and 3-D structures build-up

	-	
PL-Pd-HPB6-10mg	10 mg	75,00 EUR
PL-Pd-HPB6-50mg	50 mg	149,00 EUR



Platinum Nanoparticles, hydrophilic

Average particle size: ca. 3-4 nm Form aqueous colloidal solutions

PL-Pt-3-10mg	10 mg	113,00 EUR
PL-Pt-3-50mg	50 mg	239,00 EUR
PL-Pt-3-250mg	250 mg	759,00 EUR

Silicon

Si-nanopowder, dry

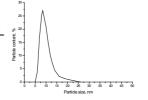
Average particle size: 100±5 nm

PL-Si-T100-5g	5 g	74,00 EUR
PL-Si-T100-25g	25 g	308,00 EUR
PL-Si-T100-100g	100 g	896,00 EUR

Silver

Ag - nanoparticles, colloidal solution in water Average particle size: ca. 10 nm; Concentration: 0,1 mg/mL

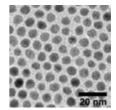
PL-Ag-S10-1mg	10 mL	21,00 EUR
PL-Ag-S10-10mg	100 mL	84,00 EUR
PL-Ag-S10-50mg	500 mL	337,00 EUR



Ag - dry nanopowder, hydrophobic

Average particle size: ca. 6-7 nm. Forms colloidal solutions in non-polar solvents. Monodisperse nanoparticles, can be used for 2-D and 3-D structures build-up. λ_{Abs} = 445 nm

PL-Ag-HPB7-10mg	10 mg	63,00 EUR
PL-Ag-HPB7-50mg	50 mg	119,00 EUR
PL-Ag-HPB7-200mg	200 mg	337,00 EUR



Ag - dry nanopowder, hydrophilic

Average particle size: ca. 100-150 nm; stabilized by PVP

PL-Ag150-10mg	10 mg	63,00 EUR
PL-Ag150-50mg	50 mg	145,00 EUR
PL-Ag150-100mg	100 mg	229,00 EUR

NanoWires

Metallic nanowires of different elements have been synthesized. Besides of those present in this catalogue, PlasmaChem can perform custom synthesis of other nanowires like Au, Ni-Co and Ni-Fe of various compositions etc.

Cobalt Nanowires

Average diameter: 200-300 nm

Length: up to 200 µm

PL-CoW200-10mg	10 mg	35,00 EUR
PL-CoW200-100mg	100 mg	241,00 EUR
PL-CoW200-1g	1 g	483,00 EUR

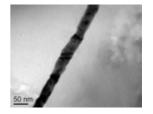


Copper Nanowires

Average diameter: 40-50 nm

Length: up to 50 µm

PL-CuW50-10mg	10 mg	23,00 EUR
PL-CuW50-50mg	50 mg	96,00 EUR
PL-CuW50-200mg	200 mg	337,00 EUR



Nickel Nanowires

Average diameter: 200-300 nm

Length: up to 200 µm

PL-NiW200-10mg	10 mg	35,00 EUR
PL-NiW200-100mg	100 mg	241,00 EUR
PL-NiW200-1g	1 g	483,00 EUR











Silver Nanowires

PL-AgW50-10mg	Average diameter 50 nm	10 mg	35,00 EUR
PL-AgW50-50mg	Length: 5-50 µm	50 mg	142,00 EUR
PL-AgW100-10mg	Average diameter 100 nm	10 mg	23,00 EUR
PL-AgW100-50mg	Length: 5-50 µm	50 mg	96,00 EUR
PL-AgW200-10mg	Average diameter 200 nm	10 mg	23,00 EUR
PL-AgW200-50mg	Length: 5-50 µm	50 mg	96,00 EUR

Silver Nanowires, dispersion in isopropanol, 0.5%

PL-AgW50-IP-25m	Diameter 50 nm	25 mL, 5 g/L	385,00 EUR
PL-AgW100-IP-25m	Diameter 100 nm	25 mL, 5 g/L	289,00 EUR
PL-AgW200-IP-25m	Diameter 200 nm	25 mL, 5 g/L	289,00 EUR

Silver Nanowires, dispersion in ethanol, 0.5%

	· .	•	
PL-AgW50-E-25m	Diameter 50 nm	25 mL, 5 g/L	385,00 EUR
PL-AgW100-E-25m	Diameter 100 nm	25 mL, 5 g/L	289,00 EUR
PL-AgW200-E-25m	Diameter 200 nm	25 mL, 5 g/L	289,00 EUR

Silver Nanowires, dispersion in water, 0.5%

PL-AgW50-DI-25m	Diameter 50 nm	25 mL, 5 g/L	385,00 EUR
PL-AgW100-DI-25m	Diameter 100 nm	25 mL, 5 g/L	289,00 EUR
PL-AgW200-DI-25m	Diameter 200 nm	25 mL, 5 g/L	289,00 EUR

TiO₂ Nanowires Length full range: 0,5-100 μm Diameter: 50-100 nm Phase: anatase

Dry powder





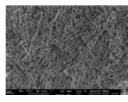
PL-TiOW50-100mg	100 mg	47,00 EUR
PL-TiOW50-500mg	500 mg	192,00 EUR
PL-TiOW50-1g	1 g	315,00 EUR

ZnO Nanowires

Length full range: 0,2-7 µm Average diameter: 50-80 nm

Dry powder

Available as hydrophobic NWs upon request





PL-ZnOW50-100mg	100 mg	47,00 EUR
PL-ZnOW50-500mg	500 mg	192,00 EUR
PL-ZnOW50-1g	1 g	314,00 EUR

Salt Nano- and Microparticles

Inorganic carbonate microparticles soluble at low pH values or in complexing agents such as EDTA. Among various applications, they are used for production of polyelectrolyte multi-layer capsules finding various applications from drug carriers to microreactors.

Barium titanate

BaTiO₃, nanopowder, hydrophilic

Primary particle average size: 40-80 nm

^	PL-BT-A-1g	1 g	59,00 EUR
	PL-BT-A-5g	5 g	168,00 EUR

Calcium Carbonate Nanoparticles

CaCO₂, nanopowder

Primary particle average size: 90±15 nm; Specific surface: ca. 20 m²/g

Particle shape: cubic; Bulk Density: ca. 0,4 g/cm³

PL-CACOU-25g	25 g	54,00 EUR
PL-CACOU-100g	100 g	168,00 EUR

Calcium Carbonate Microparticles

Absorbs polyelectrolytes and proteins in mesopores strongly.

Purity: > 99,0%

Particles shape: mesoporous, spherical

Specific surface: > 18 m²/g

Average particle size: ca. 6 µm

PL-CA6-1g	1 g	49,00 EUR
PL-CA6-5g	5 g	215,00 EUR
PL-CA6-10g	10 g	299,00 EUR

Average particle size: ca. 2-3 µm

PL-CA3-1g	1 g	78,00 EUR
PL-CA3-5g	5 g	239,00 EUR
PL-CA3-10g	10 g	360,00 EUR

Manganese Carbonate Microparticles

MnCO₃

Purity: > 99,0%

Particles shape: spherical

10 <u>10 µm</u>

Average particle size: 4-5 μm

PL-MN5-1g	1 g	78,00 EUR
PL-MN5-5g	5 g	239,00 EUR
PL-MN5-10g	10 g	360,00 EUR

Average particle size: 2-3 µm

PL-MN3-1g	1 g	78,00 EUR
PL-MN3-5g	5 g	239,00 EUR
PL-MN3-10g	10 g	360,00 EUR

Iron lodate, nonlinear optics nanocrystals

Fe(IO₃)₃ nanopowder

Particle shape: spherical to elongated; Primary particle average size: 40-80 nm Second harmonic generation nanoparticles for non-linear optics

PL-FelO80-1g	1 g	95,00 EUR
PL-FelO80-10g	10 g	350,00 EUR

Quantum Dots

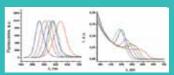
Luminescent inorganic nanocrystals (Q-dots). The emission wavelength is a function of the crystal size or structure - crystals of the same chemistry can have the emission maxima in a wide range.

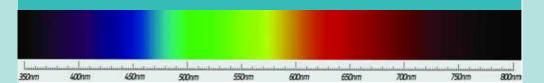
Hydrophilic Q-dots are coated with -COOH groups and can be easily used for labeling purposes for chemical and biological applications.

CdSe/ZnS, ZnCdSe/ZnS, ZnCuInS/ZnS (core/shell type), and perovskite Q-dots are available as **hydrophobic** and **hydrophilic** modifications.

Q-dots can be supplied up to kilogram quantities.







CdTe Quantum Dots, hydrophilic

Easily forms colloidal solutions in water. Terminated with -COOH group. Supplied as a powder readily soluble in water. Ideal for labelling purposes. Coupling with -NH_a groups can be achieved through EDC-mediated esterification.

General labeling procedure for proteins

(adopted from Wang et al. Nanoletters 2002, vol. 2, No. 8, 817-822):

Reaction mixture containing 0,1 μ M/mL CdTe quantum dots, 2 mg/mL protein, 1 mg/mL sulfo-NHS (CAS# 106627-54-7), 10 mg/mL EDC (CAS# 25952-53-8) in pH 7,0 PBS buffer is prepared and stored for 2-4 h at room temperature and then stored at 4°C overnight.

The precipitate (unconjugated Q-dots) if any is removed by centrifugation. The stock of ready-to-use product should be stored at 4°C. Optionally it can be dialyzed on a membrane with MWCO of 12000-14000 against pH 7,0 PBS buffer and stored at 4°C. Emission wavelength may slightly shift after labeling procedure.

Emission max.	Mw	Size	Catalogue Number	Quantity	Price
		ш	PL-QDN-510-5mg	5 mg	53,00 EUR
510 ± 5 nm	Da		PL-QDN-510-10mg	10 mg	95,00 EUR
510 ± 5 11111	~3200	,5 n	PL-QDN-510-25mg	25 mg	203,00 EUR
	€,	7	PL-QDN-510-50mg	50 mg	362,00 EUR
	Ø		PL-QDN-520-5mg	5 mg	53,00 EUR
520 ± 5 nm		0 Da	PL-QDN-520-10mg	10 mg	95,00 EUR
320 ± 3 IIIII	~16000	~2,0 nm	PL-QDN-520-25mg	25 mg	203,00 EUR
	\frac{1}{2} \infty	~ 2, 2,	PL-QDN-520-50mg	50 mg	362,00 EUR

	a		PL-QDN-530-5mg	5 mg	53,00 EUR
530 ± 5 nm	0 0	Ε	PL-QDN-530-10mg	10 mg	95,00 EUR
330 ± 3 1111	~20000 Da	~2,2 nm	PL-QDN-530-25mg	25 mg	203,00 EUR
	~2	~2	PL-QDN-530-50mg	50 mg	362,00 EUR
	a		PL-QDN-540-5mg	5 mg	53,00 EUR
540 ± 5 nm	~25000 Da	Ε	PL-QDN-540-10mg	10 mg	95,00 EUR
540 ± 5 IIIII	200	~2,3 nm	PL-QDN-540-25mg	25 mg	203,00 EUR
	~2	~2	PL-QDN-540-50mg	50 mg	95,00 EUR 203,00 EUR 362,00 EUR 95,00 EUR 95,00 EUR 362,00 EUR 362,00 EUR 95,00 EUR 203,00 EUR 203,00 EUR 362,00 EUR 53,00 EUR 203,00 EUR 203,00 EUR 203,00 EUR 362,00 EUR 203,00 EUR 203,00 EUR 203,00 EUR 203,00 EUR 362,00 EUR 203,00 EUR 362,00 EUR 203,00 EUR 203,00 EUR 203,00 EUR 362,00 EUR 203,00 EUR 362,00 EUR 203,00 EUR 362,00 EUR 362,00 EUR 53,00 EUR 95,00 EUR 203,00 EUR
	a		PL-QDN-550-5mg	5 mg	53,00 EUR
550 ± 5 mm	~32000 Da	Ε	PL-QDN-550-10mg	10 mg	95,00 EUR
550 ± 5 nm	200	~2,6 nm	PL-QDN-550-25mg	25 mg	203,00 EUR
	χ, 33	2	PL-QDN-550-50mg	50 mg	362,00 EUR
	w.		PL-QDN-560-5mg	5 mg	53,00 EUR
500 ± 5 mm	~55000 Da	Ε	PL-QDN-560-10mg	10 mg	95,00 EUR
560 ± 5 nm	200	~3,0 nm	PL-QDN-560-25mg	25 mg	203,00 EUR
	~5		PL-QDN-560-50mg	50 mg	362,00 EUR
	a		PL-QDN-570-5mg	5 mg	53,00 EUR
570 ± 5 nm	0	~59000 Da ~3,1 nm	PL-QDN-570-10mg	10 mg	95,00 EUR
570 ± 5 IIIII	900		PL-QDN-570-25mg	25 mg	203,00 EUR
	~25		PL-QDN-570-50mg	50 mg	362,00 EUR
	a	υ	PL-QDN-580-5mg	5 mg	53,00 EUR
580 ± 5 nm	0 Da	٤	PL-QDN-580-10mg	10 mg	95,00 EUR
560 ± 5 IIIII	~67000	~3,2 nm	PL-QDN-580-25mg	25 mg	203,00 EUR
	9~		PL-QDN-580-50mg	50 mg	362,00 EUR
	a		PL-QDN-590-5mg	5 mg	53,00 EUR
590 ± 5 nm	~71000 Da	٤	PL-QDN-590-10mg	10 mg	95,00 EUR
590 ± 5 IIIII	100	~3,3 nm	PL-QDN-590-25mg	25 mg	203,00 EUR
	~		PL-QDN-590-50mg	50 mg	362,00 EUR
	а		PL-QDN-600-5mg	5 mg	53,00 EUR
600 ± 5 nm	0 Da	띮	PL-QDN-600-10mg	10 mg	95,00 EUR
900 ± 9 IIII	0009		PL-QDN-600-25mg	25 mg	203,00 EUR
	~76	~3,4	PL-QDN-600-50mg	50 mg	362,00 EUR
	a		PL-QDN-610-5mg	5 mg	53,00 EUR
610 ± F ~~	0	٤	PL-QDN-610-10mg	10 mg	95,00 EUR
610 ± 5 nm	~81000 Da	~3,5 nm	PL-QDN-610-25mg	25 mg	203,00 EUR
	~81		PL-QDN-610-50mg	50 mg	362,00 EUR

•					
	m m		PL-QDN-620-5mg	5 mg	53,00 EUR
620 ± 5 nm	~88000 Da	٤	PL-QDN-620-10mg	10 mg	95,00 EUR
020 ± 5 IIIII	800	~3,6 nm	PL-QDN-620-25mg	25 mg	203,00 EUR
	∞ ≀		PL-QDN-620-50mg	50 mg	362,00 EUR
	a		PL-QDN-630-5mg	5 mg	53,00 EUR
630 ± 5 nm	~89000 Da	Ε	PL-QDN-630-10mg	10 mg	95,00 EUR
630 ± 5 IIII	006	~3,6 nm	PL-QDN-630-25mg	25 mg	203,00 EUR
	8		PL-QDN-630-50mg	50 mg	362,00 EUR
	a		PL-QDN-640-5mg	5 mg	53,00 EUR
640 ± 5 nm	~90000 Da	٤	PL-QDN-640-10mg	10 mg	95,00 EUR
640 ± 5 IIIII	000	~3,7 nm	PL-QDN-640-25mg	25 mg	203,00 EUR
	ō ~		PL-QDN-640-50mg	50 mg	362,00 EUR
	Эа		PL-QDN-650-5mg	5 mg	53,00 EUR
650 ± 5 nm	~103000 Da	٤	PL-QDN-650-10mg	10 mg	95,00 EUR
650 ± 5 IIII	030	~3,8 nm	PL-QDN-650-25mg	25 mg	203,00 EUR
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		PL-QDN-650-50mg	50 mg	362,00 EUR
	Эа	~111000 Da ~3,9 nm	PL-QDN-660-5mg	5 mg	53,00 EUR
660 ± 5 nm	1 00		PL-QDN-660-10mg	10 mg	95,00 EUR
660 ± 5 IIII	110		PL-QDN-660-25mg	25 mg	203,00 EUR
	1		PL-QDN-660-50mg	50 mg	362,00 EUR
	Оа	~124000 Da ~4,0 nm	PL-QDN-670-5mg	5 mg	53,00 EUR
670 + 5 nm	00		PL-QDN-670-10mg	10 mg	95,00 EUR
670 ± 5 nm	240		PL-QDN-670-25mg	25 mg	203,00 EUR
	7	4~	PL-QDN-670-50mg	50 mg	362,00 EUR
	Da		PL-QDN-680-5mg	5 mg	53,00 EUR
680 ± 5 nm	00	٤	PL-QDN-680-10mg	10 mg	95,00 EUR
660 ± 5 IIII	~146000 Da	~4,2 nm	PL-QDN-680-25mg	25 mg	203,00 EUR
	\[\frac{1}{2}\]	4~	PL-QDN-680-50mg	50 mg	362,00 EUR
	Оа		PL-QDN-690-5mg	5 mg	53,00 EUR
690 ± 5 nm	000 Da	띮	PL-QDN-690-10mg	10 mg	95,00 EUR
690 ± 5 IIII	009		PL-QDN-690-25mg	25 mg	203,00 EUR
	~160	~4,3	PL-QDN-690-50mg	50 mg	362,00 EUR
	Оа		PL-QDN-700-5mg	5 mg	53,00 EUR
700 + 5 nm	00	٤	PL-QDN-700-10mg	10 mg	95,00 EUR
700 ± 5 nm	~177000 Da	~4,5 nm	PL-QDN-700-25mg	25 mg	203,00 EUR
	7	4~	PL-QDN-700-50mg	50 mg	362,00 EUR

	Оа		PL-QDN-710-5mg	5 mg	53,00 EUR											
710 ± 5 nm	00	٤	PL-QDN-710-10mg	10 mg	95,00 EUR											
710 ± 311111	~200000 Da	~4,7 nm	PL-QDN-710-25mg	25 mg	203,00 EUR											
	~	4	PL-QDN-710-50mg	50 mg	362,00 EUR											
	Da		PL-QDN-720-5mg	5 mg	53,00 EUR											
720 ± 5 nm	00	٤	PL-QDN-720-10mg	10 mg	95,00 EUR											
720 1 3 11111	~230000	~5,0 nm	PL-QDN-720-25mg	25 mg	203,00 EUR											
	~ ~	5.	PL-QDN-720-50mg	50 mg	362,00 EUR											
	Da		PL-QDN-730-5mg	5 mg	53,00 EUR											
730 ± 5 nm	~320000 Da	Ē	PL-QDN-730-10mg	10 mg	95,00 EUR											
700 2 0 11111	200	~5,4 nm	PL-QDN-730-25mg	25 mg	203,00 EUR											
	წ	5.	PL-QDN-730-50mg	50 mg	362,00 EUR											
	Da		PL-QDN-740-5mg	5 mg	53,00 EUR											
740 ± 5 nm	00	Ē	PL-QDN-740-10mg	10 mg	95,00 EUR											
740 = 0 11111	~430000 Da	~6,0 nm	PL-QDN-740-25mg	25 mg	203,00 EUR											
	4	9	PL-QDN-740-50mg	50 mg	362,00 EUR											
	Da	~6,5 nm	PL-QDN-750-5mg	5 mg	53,00 EUR											
750 ± 5 nm	~550000 Da		PL-QDN-750-10mg	10 mg	95,00 EUR											
700 ± 0 11111	200		PL-QDN-750-25mg	25 mg	203,00 EUR											
	ξ.	9	PL-QDN-750-50mg	50 mg	362,00 EUR											
	Ра	00 Da m	PL-QDN-760-5mg	5 mg	53,00 EUR											
760 ± 5 nm	~700000 Da		PL-QDN-760-10mg	10 mg	95,00 EUR											
700 1 3 11111		7007	7007	000	000.	000.	700	700	7000	ე00.	ე00.	000	~7,1 nm	PL-QDN-760-25mg	25 mg	203,00 EUR
		~	PL-QDN-760-50mg	50 mg	362,00 EUR											
	Ø	a	PL-QDN-770-5mg	5 mg	53,00 EUR											
770 5	0	_	PL-QDN-770-10mg	10 mg	95,00 EUR											
770 ± 5 nm	~900000 Da	~7,8 nm	PL-QDN-770-25mg	25 mg	203,00 EUR											
)6~	~7.	PL-QDN-770-50mg	50 mg	362,00 EUR											
	Оа		PL-QDN-780-5mg	5 mg	53,00 EUR											
	000		PL-QDN-780-10mg	10 mg	95,00 EUR											
780 ± 5 nm)000	E	PL-QDN-780-25mg	25 mg	203,00 EUR											
	~1000(~8,6 nr	PL-QDN-780-50mg	50 mg	362,00 EUR											
		(PL-QDN-790-5mg	5 mg	53,00 EUR											
	Ö		PL-QDN-790-10mg													
790 ± 5 nm	000	톧		10 mg	95,00 EUR											
	~1630000 Da	~9,4 nm	PL-QDN-790-25mg	25 mg	203,00 EUR											
	ì	Ĭ,	PL-QDN-790-50mg	50 mg	362,00 EUR											

ZnCdSe/ZnS (core/shell) Quantum Dots, dry, hydrophobic

Highly luminescent semiconductor nanocrystals coated with hydrophobic organic molecules. Readily soluble in toluene, chloroform, tetrahydrofuran, pyridine etc. Not soluble in water, alcohols, ethers.

	Da		PL-QD-O-440-5mg	5 mg	56,00 EUR
440 ± 5 nm		_	PL-QD-O-440-10mg	10 mg	99,00 EUR
440 ± 5 IIII	000009-	6 nm	PL-QD-O-440-25mg	25 mg	215,00 EUR
	9~		PL-QD-O-440-50mg	50 mg	379,00 EUR
	00 Da	g	PL-QD-O-480-5mg	5 mg	56,00 EUR
480 ± 5 nm		_	PL-QD-O-480-10mg	10 mg	99,00 EUR
460 ± 5 IIII	-640000	4000 nm	PL-QD-O-480-25mg	25 mg	215,00 EUR
	φ.	9 ~	PL-QD-O-480-50mg	50 mg	379,00 EUR

CdSe/ZnS (core/shell) Quantum Dots, dry, hydrophobic

Highly luminescent semiconductor nanocrystals coated with hydrophobic organic molecules. Readily soluble in toluene, chloroform, tetrahydrofuran, pyridine etc. Not soluble in water, alcohols, ethers. ZnS shell thickness - ca. 0,6 nm.

530 ± 5 nm	~53000 Da	Core Dia. ~ 2,5 nm	PL-QD-O-530-5mg	5 mg	56,00 EUR
			PL-QD-O-530-10mg	10 mg	99,00 EUR
			PL-QD-O-530-25mg	25 mg	215,00 EUR
			PL-QD-O-530-50mg	50 mg	379,00 EUR
540 ± 5 nm	~59000 Da	Core Dia. ~ 2,6 nm	PL-QD-O-540-5mg	5 mg	56,00 EUR
			PL-QD-O-540-10mg	10 mg	99,00 EUR
			PL-QD-O-540-25mg	25 mg	215,00 EUR
			PL-QD-O-540-50mg	50 mg	379,00 EUR
550 ± 5 nm	~68000 Da	Core Dia. ~ 2,9 nm	PL-QD-O-550-5mg	5 mg	56,00 EUR
			PL-QD-O-550-10mg	10 mg	99,00 EUR
			PL-QD-O-550-25mg	25 mg	215,00 EUR
			PL-QD-O-550-50mg	50 mg	379,00 EUR
560 ± 5 nm	~79000 Da	Core Dia. ~ 3,0 nm	PL-QD-O-560-5mg	5 mg	56,00 EUR
			PL-QD-O-560-10mg	10 mg	99,00 EUR
			PL-QD-O-560-25mg	25 mg	215,00 EUR
			PL-QD-O-560-50mg	50 mg	379,00 EUR
570 ± 5 nm	~93000 Da	Core Dia. ~ 3,3 nm	PL-QD-O-570-5mg	5 mg	56,00 EUR
			PL-QD-O-570-10mg	10 mg	99,00 EUR
			PL-QD-O-570-25mg	25 mg	215,00 EUR
			PL-QD-O-570-50mg	50 mg	379,00 EUR

580 ± 5 nm	Эа	Core Dia. ~ 3,5 nm	PL-QD-O-580-5mg	5 mg	56,00 EUR
	~112000 Da		PL-QD-O-580-10mg	10 mg	99,00 EUR
	120		PL-QD-O-580-25mg	25 mg	215,00 EUR
	ī		PL-QD-O-580-50mg	50 mg	379,00 EUR
590 ± 5 nm	Da	Core Dia. ~ 3,7 nm	PL-QD-O-590-5mg	5 mg	56,00 EUR
	~138000 [PL-QD-O-590-10mg	10 mg	99,00 EUR
			PL-QD-O-590-25mg	25 mg	215,00 EUR
			PL-QD-O-590-50mg	50 mg	379,00 EUR
	Оа	Core Dia. ~ 4,0 nm	PL-QD-O-600-5mg	5 mg	56,00 EUR
C00 + 5	~173000 Da		PL-QD-O-600-10mg	10 mg	99,00 EUR
600 ± 5 nm	730		PL-QD-O-600-25mg	25 mg	215,00 EUR
	1		PL-QD-O-600-50mg	50 mg	379,00 EUR
	Оа		PL-QD-O-610-5mg	5 mg	56,00 EUR
610 ± 5 nm	~221000 Da	Core Dia. ~ 4,4 nm	PL-QD-O-610-10mg	10 mg	99,00 EUR
	210		PL-QD-O-610-25mg	25 mg	215,00 EUR
	~2		PL-QD-O-610-50mg	50 mg	379,00 EUR
620 ± 5 nm	Da	Core Dia. ~ 4,8 nm	PL-QD-O-620-5mg	5 mg	56,00 EUR
	00		PL-QD-O-620-10mg	10 mg	99,00 EUR
	~285000		PL-QD-O-620-25mg	25 mg	215,00 EUR
	~2		PL-QD-O-620-50mg	50 mg	379,00 EUR
	~375000 Da	Core Dia. ~ 5,4 nm	PL-QD-O-630-5mg	5 mg	56,00 EUR
620 ± 5 nm			PL-QD-O-630-10mg	10 mg	99,00 EUR
630 ± 5 nm	750		PL-QD-O-630-25mg	25 mg	215,00 EUR
	33		PL-QD-O-630-50mg	50 mg	379,00 EUR
640 ± 5 nm	~499000 Da	Core Dia. ~ 6,0 nm	PL-QD-O-640-5mg	5 mg	56,00 EUR
			PL-QD-O-640-10mg	10 mg	99,00 EUR
			PL-QD-O-640-25mg	25 mg	215,00 EUR
	4		PL-QD-O-640-50mg	50 mg	379,00 EUR
650 ± 5 nm	Оа	Core Dia. ~ 6,7 nm	PL-QD-O-650-5mg	5 mg	56,00 EUR
	100		PL-QD-O-650-10mg	10 mg	99,00 EUR
	~671000 Da		PL-QD-O-650-25mg	25 mg	215,00 EUR
			PL-QD-O-650-50mg	50 mg	379,00 EUR

ZnCdSeS Quantum Dots, low-Cd, hydrophobic

Alloyed QDs are the newest generation of low-cadmium, highly luminescent semi-conductor nanocrystals with **improved stability** and compatibility with composites. Coated with hydrophobic organic molecules. Readily soluble in hexane, heptane, toluene, chloroform, tetrahydrofuran, pyridine. Diameter ca. 6 nm. Supplied dry.

<u> </u>			• • • •
	PL-QD-OA-470-5mg	5 mg	44,00 EUR
470 ± 5 nm	PL-QD-OA-470-10mg	10 mg	79,00 EUR
470 ± 5 IIIII	PL-QD-OA-470-25mg	25 mg	161,00 EUR
	PL-QD-OA-470-50mg	50 mg	299,00 EUR
	PL-QD-OA-480-5mg	5 mg	44,00 EUR
480 ± 5 nm	PL-QD-OA-480-10mg	10 mg	79,00 EUR
400 ± 5 IIII	PL-QD-OA-480-25mg	25 mg	161,00 EUR
	PL-QD-OA-480-50mg	50 mg	299,00 EUR
	PL-QD-OA-490-5mg	5 mg	44,00 EUR
490 ± 5 nm	PL-QD-OA-490-10mg	10 mg	79,00 EUR
490 ± 5 mm	PL-QD-OA-490-25mg	25 mg	161,00 EUR
	PL-QD-OA-490-50mg	50 mg	299,00 EUR
	PL-QD-OA-500-5mg	5 mg	44,00 EUR
500 ± 5 nm	PL-QD-OA-500-10mg	10 mg	79,00 EUR
500 ± 5 IIIII	PL-QD-OA-500-25mg	25 mg	161,00 EUR
	PL-QD-OA-500-50mg	50 mg	299,00 EUR
	PL-QD-OA-510-5mg	5 mg	44,00 EUR
510 ± 5 nm	PL-QD-OA-510-10mg	10 mg	79,00 EUR
310 ± 3 11111	PL-QD-OA-510-25mg	25 mg	161,00 EUR
	PL-QD-OA-510-50mg	50 mg	299,00 EUR
	PL-QD-OA-520-5mg	5 mg	44,00 EUR
520 ± 5 nm	PL-QD-OA-520-10mg	10 mg	79,00 EUR
520 ± 5 IIIII	PL-QD-OA-520-25mg	25 mg	161,00 EUR
	PL-QD-OA-520-50mg	50 mg	299,00 EUR
	PL-QD-OA-530-5mg	5 mg	44,00 EUR
530 ± 5 nm	PL-QD-OA-530-10mg	10 mg	79,00 EUR
550 ± 5 IIII	PL-QD-OA-530-25mg	25 mg	161,00 EUR
	PL-QD-OA-530-50mg	50 mg	299,00 EUR
	PL-QD-OA-540-5mg	5 mg	44,00 EUR
540 ± 5 nm	PL-QD-OA-540-10mg	10 mg	79,00 EUR
340 ± 3 IIIII	PL-QD-OA-540-25mg	25 mg	161,00 EUR
	PL-QD-OA-540-50mg	50 mg	299,00 EUR

		1 -	
	PL-QD-OA-550-5mg	5 mg	44,00 EUR
550 ± 5 nm	PL-QD-OA-550-10mg	10 mg	79,00 EUR
	PL-QD-OA-550-25mg	25 mg	161,00 EUR
	PL-QD-OA-550-50mg	50 mg	299,00 EUR
	PL-QD-OA-560-5mg	5 mg	44,00 EUR
560 ± 5 nm	PL-QD-OA-560-10mg	10 mg	79,00 EUR
000 1 0 11111	PL-QD-OA-560-25mg	25 mg	161,00 EUR
	PL-QD-OA-560-50mg	50 mg	299,00 EUR
	PL-QD-OA-570-5mg	5 mg	44,00 EUR
570 ± 5 nm	PL-QD-OA-570-10mg	10 mg	79,00 EUR
370 ± 3 11111	PL-QD-OA-570-25mg	25 mg	161,00 EUR
	PL-QD-OA-570-50mg	50 mg	299,00 EUR
	PL-QD-OA-580-5mg	5 mg	44,00 EUR
580 ± 5 nm	PL-QD-OA-580-10mg	10 mg	79,00 EUR
300 ± 3 IIII	PL-QD-OA-580-25mg	25 mg	161,00 EUR
	PL-QD-OA-580-50mg	50 mg	299,00 EUR
	PL-QD-OA-590-5mg	5 mg	44,00 EUR
590 ± 5 nm	PL-QD-OA-590-10mg	10 mg	79,00 EUR
390 ± 5 IIII	PL-QD-OA-590-25mg	25 mg	161,00 EUR
	PL-QD-OA-590-50mg	50 mg	299,00 EUR
	PL-QD-OA-600-5mg	5 mg	44,00 EUR
600 I 5	PL-QD-OA-600-10mg	10 mg	79,00 EUR
600 ± 5 nm	PL-QD-OA-600-25mg	25 mg	161,00 EUR
	PL-QD-OA-600-50mg	50 mg	299,00 EUR
	PL-QD-OA-610-5mg	5 mg	44,00 EUR
040 5	PL-QD-OA-610-10mg	10 mg	79,00 EUR
610 ± 5 nm	PL-QD-OA-610-25mg	25 mg	161,00 EUR
	PL-QD-OA-610-50mg	50 mg	299,00 EUR
	PL-QD-OA-620-5mg	5 mg	44,00 EUR
000 1 5	PL-QD-OA-620-10mg	10 mg	79,00 EUR
620 ± 5 nm	PL-QD-OA-620-25mg	25 mg	161,00 EUR
	PL-QD-OA-620-50mg	50 mg	299,00 EUR
	PL-QD-OA-630-5mg	5 mg	44,00 EUR
	PL-QD-OA-630-10mg	10 mg	79,00 EUR
630 ± 5 nm	PL-QD-OA-630-25mg	25 mg	161,00 EUR
	PL-QD-OA-630-50mg	50 mg	299,00 EUR

Zn-Cu-In-S/ZnS Quantum Dots, cadmium free, hydrophobic

Non-toxic luminescent Zn-Cu-ln-S / ZnS (core / shell) quantum dots coated with hydrophobic organic ligands. Readily soluble in toluene, chloroform and similar solvents. Not soluble in water, alcohols, ethers. Emission peak width (FWHM) ca. 100 nm. Large Stokes shift (ca. 120 nm). Particle size: 4-5 nm. Supplied as a readily soluble powder



530 ± 15 nm λ emission maximum

PL-QD-CF-530-25mg	25 mg	108,00 EUR
PL-QD-CF-530-100mg	100 mg	338,00 EUR
PL-QD-CF-530-250mg	250 mg	765,00 EUR

560 ± 15 nm λ emission maximum

PL-QD-CF-560-25mg	25 mg	108,00 EUR
PL-QD-CF-560-100mg	100 mg	338,00 EUR
PL-QD-CF-560-250mg	250 mg	765,00 EUR

590 ± 15 nm λ emission maximum

PL-QD-CF-590-25mg	25 mg	108,00 EUR
PL-QD-CF-590-100mg	100 mg	338,00 EUR
PL-QD-CF-590-250mg	250 mg	765,00 EUR

610 ± 15 nm λ emission maximum

PL-QD-CF-610-25mg	25 mg	108,00 EUR
PL-QD-CF-610-100mg	100 mg	338,00 EUR
PL-QD-CF-610-250mg	250 mg	765,00 EUR

650 ± 25 nm λ emission maximum

PL-QD-CF-650-25mg	25 mg	108,00 EUR
PL-QD-CF-650-100mg	100 mg	338,00 EUR
PL-QD-CF-650-250mg	250 mg	765,00 EUR

700 ± 25 nm λ emission maximum

PL-QD-CF-700-25mg	25 mg	108,00 EUR
PL-QD-CF-700-100mg	100 mg	338,00 EUR
PL-QD-CF-700-250mg	250 mg	765,00 EUR

AgInS₂ / ZnS Quantum Dots, Cd-free, Cu-free, hydrophobic

Non-toxic luminescent AgInS_2 / ZnS (core/shell) quantum dots coated with hydrophobic organic ligands. Readily soluble in hexane, toluene, chloroform and similar solvents. Not soluble in water, alcohols, ethers. Emission peak width (FWHM) ca. 80-160 nm. Supplied as a readily soluble powder



530 ± 20 nm λ emission maximum

PL-QD-AIS-530-25mg	25 mg	99,00 EUR
PL-QD-AIS-530-100mg	100 mg	339,00 EUR
PL-QD-AIS-530-250mg	200 mg	599,00 EUR

570 ± 20 nm λ emission maximum

PL-QD-AIS-570-25mg	25 mg	99,00 EUR
PL-QD-AIS-570-100mg	100 mg	339,00 EUR
PL-QD-AIS-570-250mg	200 mg	599,00 EUR

610 ± 20 nm λ emission maximum

PL-QD-AIS-610-25mg	25 mg	99,00 EUR
PL-QD-AIS-610-100mg	100 mg	339,00 EUR
PL-QD-AIS-610-250mg	200 mg	599,00 EUR

650 ± 20 nm λ emission maximum

PL-QD-AIS-650-25mg	25 mg	99,00 EUR
PL-QD-AIS-650-100mg	100 mg	339,00 EUR
PL-QD-AIS-650-250mg	200 mg	599,00 EUR

690 ± 20 nm λ emission maximum

PL-QD-AIS-690-25mg	25 mg	99,00 EUR
PL-QD-AIS-690-100mg	100 mg	339,00 EUR
PL-QD-AIS-690-250mg	200 mg	599,00 EUR

730 ± 20 nm λ emission maximum

PL-QD-AIS-730-25mg	25 mg	99,00 EUR
PL-QD-AIS-730-100mg	100 mg	339,00 EUR
PL-QD-AIS-730-250mg	200 mg	599,00 EUR

770 ± 20 nm λ emission maximum

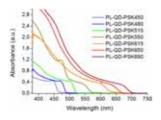
PL-QD-AIS-770-25mg	25 mg	99,00 EUR
PL-QD-AIS-770-100mg	100 mg	339,00 EUR
PL-QD-AIS-770-250mg	200 mg	599,00 EUR

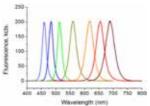
Perovskite Quantum Dots, cadmium free, hydrophobic

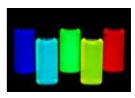


Cd-free strongly luminescent perovskite quantum dots of structure ABC_3 coated with hydrophobic organic ligands. Readily soluble in toluene, hexane, chlorobenzene and similar dry solvents. Not soluble in alcohols, ethers and other polar solvents. Avoid using water or water-containing solvents. Emission peak width (FWHM) ca. 15-35 nm. Particle size: ca. 10 nm.

Ideal for **industrial applications** due to the large scale manufacturing, and the **lowest prices among all available QDs**. For bulk quantities, please contact us at info@plasmachem.com







	PL-QD-PSK-450-5mg	5 mg	30,00 EUR
450 ± 15 nm	PL-QD-PSK-450-50mg	50 mg	160,00 EUR
	PL-QD-PSK-450-500mg	500 mg	450,00 EUR
	PL-QD-PSK-480-5mg	5 mg	30,00 EUR
480 ± 15 nm	PL-QD-PSK-480-50mg	50 mg	160,00 EUR
	PL-QD-PSK-480-500mg	500 mg	450,00 EUR
	PL-QD-PSK-510-5mg	5 mg	30,00 EUR
510 ± 15 nm	PL-QD-PSK-510-50mg	50 mg	160,00 EUR
	PL-QD-PSK-510-500mg	500 mg	450,00 EUR
	PL-QD-PSK-530-5mg	5 mg	30,00 EUR
530 ± 15 nm	PL-QD-PSK-530-50mg	50 mg	160,00 EUR
	PL-QD-PSK-530-500mg	500 mg	450,00 EUR
	PL-QD-PSK-550-5mg	5 mg	30,00 EUR
550 ± 15 nm	PL-QD-PSK-550-50mg	50 mg	160,00 EUR
	PL-QD-PSK-550-500mg	500 mg	450,00 EUR

Quantum Dots Kits - hydrophilic

Get quantum dots of different colours at a reduced price.

Hydrophilic CdTe Quantum Dots Kit

One kit of five types of quantum dots, 5 mg, 10 mg or 50 mg each type: Supplied as dry powder. Soluble in water.

Green - $\lambda_{emission max}$ 510-550 nm Yellow - $\lambda_{emission max}$ 560-580 nm Orange - $\lambda_{emission max}$ 590-620 nm Red - $\lambda_{emission max}$ 630-650 nm Ruby - $\lambda_{emission max}$ 660-700 nm

PL-QDN-Kit5	5 x 5 mg	179,00 EUR
PL-QDN-Kit10	5 x 10 mg	271,00 EUR
PL-QDN-Kit50	5 x 50 mg	1087,00 EUR

Quantum Dots Kits - hydrophobic

Get quantum dots of different colours at a reduced price.

Hydrophobic CdSe/ZnS Quantum Dots Kit

One kit of five types of quantum dots, 5 mg, 10 mg or 50 mg each type: Supplied as dry powder. Soluble in chloroform, toluene etc.

Blue - $\lambda_{emission \ max}$ 450-500 nm Green - $\lambda_{emission \ max}$ 510-550 nm Yellow - $\lambda_{emission \ max}$ 560-580 nm Orange - $\lambda_{emission \ max}$ 590-620 nm Red - $\lambda_{emission \ max}$ 630-650 nm

PL-QD-O-Kit5	5 x 5 mg	179,00 EUR
PL-QD-O-Kit10	5 x 10 mg	271,00 EUR
PL-QD-O-Kit50	5 x 50 mg	1087,00 EUR

Hydrophobic Zn-Cu-In-S/ZnS Cd-free Quantum Dot Kit

One kit of four types of quantum dots, 10 mg, 25 mg or 100 mg each type: Supplied as dry powder. Soluble in hexane, toluene etc.

Green - λ_{em} . 530 ± 20 nm Yellow - λ_{em} . 570 ± 20 nm Orange - λ_{em} . 610 ± 20 nm Ruby - λ_{em} . 670 ± 30 nm

PL-QD-CF-Kit10	4 x 10 mg	179,00 EUR
PL-QD-CF-Kit25	4 x 25 mg	277,00 EUR
PL-QD-CF-Kit100	4 x 100 mg	845,00 EUR

Hydrophobic alloyed ZnCdSeS Quantum Dots Kit

One kit of five types of quantum dots, 10 mg, 25 mg or 100 mg each type: Supplied as dry powder. Soluble in hexane, toluene etc.

Blue - $\lambda_{em.}$ 470-480 nm Cyan - $\lambda_{em.}$ 490-500 nm Green - $\lambda_{em.}$ 510-550 nm Yellow - $\lambda_{em.}$ 560-580 nm Orange - $\lambda_{em.}$ 590-620 nm

PL-QD-OA-Kit10	5 x 10 mg	239,00 EUR
PL-QD-OA-Kit25	5 x 25 mg	591,00 EUR
PL-QD-OA-Kit100	5 x 100 mg	1874,00 EUR



Metal-Organic Frameworks (MOFs)

MOFs are crystalline compounds consisting of metal ions coordinated to organic molecules to form porous three-dimensional structures. Possible applications include storage of gases such as H₂ and CO₂, gas purification / separation, in catalysis and as sensors.

ZIF-8, 2-methylimidazole zinc salt

Large cavities (11.6 Å) connected by small windows (3.4 Å)

Specific surface: ca. 1600 m²/g, Empirical Formula C_gH₁₀N₄Zn; Mw: 227,6

PL-MOF-ZIF8-1g	1 g	41,00 EUR
PL-MOF-ZIF8-10g	10 g	138,00 EUR
PL-MOF-ZIF8-100g	100 g	990,00 EUR

ZIF-67, 2-methylimidazole cobalt salt

Large cavities (11.6 Å) connected by small windows (3.4 Å)

Specific surface: ca. 1500 m²/g; Empirical Formula C_oH₄₀N₄Co; Mw: 221,1

PL-MOF-ZIF67-1g	1 g	41,00 EUR
PL-MOF-ZIF67-10g	10 g	138,00 EUR
PL-MOF-ZIF67-100g	100 g	990,00 EUR

PEG Derivatives

PEG oligomers are processed into a variety of derivatives. A high purity for intermediates and products is maintained, and our catalogue items have an overall purity exceeding 95%. In comparison to PEG products obtained from polydisperse material, the use of our compounds is therefore more consistent.

mPEG-6 Thiol

Purity: > 95% Colorless liquid. MW 356

PL-PEG-T-250mg	250 mg	132,00 EUR
PL-PEG-T-500mg	500 mg	263,00 EUR

PEG NHS Ester Disulfide

Purity: > 95% Oily liquid. MW 1109

PL-PEG-NHS-250mg	250 mg	210,00 EUR
PL-PEG-NHS-500mg	500 mg	418,00 EUR

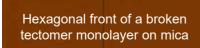
Tectomers

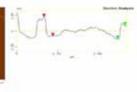
Tectomers are a novel type of self-assembling molecules. The structure of a tectomer represents several oligoglycine units linked to one common center. The pH dependent formation of strong hydrogen bonds between molecules leads to their selfassembly into extra-regular 2-D or 3-D layers of monomolecular thickness.10 mg of any tectomer is enough for coating of more than 2 m² of surface.











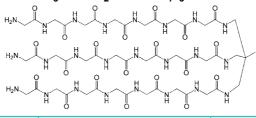
Tectomer 2-tailed, C₈H₁₆(-CH₂-NH-Gly₄)₂ * 2 HCl

Purity: > 95%

PL-TEC-2-10mg	10 mg	84,00 EUR
PL-TEC-2-25mg	25 mg	179,00 EUR

Tectomer 3-tailed, CH₃C(-CH₂-NH-Gly₇)₃ * 3 TFA

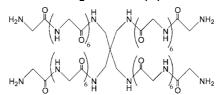
Purity: > 95%



PL-TEC-3-10mg	10 mg	84,00 EUR
PL-TEC-3-25mg	25 mg	179,00 EUR

Tectomer 4-tailed, C(-CH₂-NH-Gly₇)₄ * 4 HCl

Purity: > 95%



PL-TEC-4-10mg	10 mg	84,00 EUR
PL-TEC-4-25mg	25 mg	179,00 EUR

Phosphonic Acids

Alkylphosphonic acids are widely used for production of nanoparticles such as quantum dots, nano-metals, nano-ceramics. By varying the carbohydral chain length one can change the particles' shape and size. Besides, they can be used for coating of many materials (including nanoparticles) by condensed hydrophobic monolayers.

n-Alkylphosphonic acids kit

One kit of all seven n-Alkylphosphonic acids, 5 g. each:

- 1 x PL-HPA-5g
- 1 x PL-OPA-5q
- 1 x PL-DPA-5g
- 1 x PL-DDPA-5q
- 1 x PL-TDPA-5a
- 1 x PL-HDPA-5g
- 1 x PL-ODPA-5g

	0
_	
R-	-P—OH
	ОН

PL-PA-Kit	1 kit	650,00 EUR
-----------	-------	------------

n-Hexylphosphonic acid, tech.

 $C_6H_{13}P(O)(OH)_2$

Purity: > 97% T_m >85°C White to off-white powder

PL-HPA-1g	1 g	40,00 EUR
PL-HPA-5g	5 g	149,00 EUR
PL-HPA-10g	10 g	202,00 EUR
PL-HPA-50g	50 g	698,00 EUR

n-Octylphosphonic acid, tech.

 $C_8H_{17}P(O)(OH)_2$

Purity: > 97% T_m >85°C White to off-white powder

PL-OPA-1g	1 g	40,00 EUR
PL-OPA-5g	5 g	149,00 EUR
PL-OPA-10g	10 g	202,00 EUR
PL-OPA-50g	50 g	698,00 EUR

n-Decylphosphonic acid, tech.

 $C_{10}H_{21}P(O)(OH)_{2}$

Purity: > 97% T_m>85°C White to off-white powder

PL-DPA-1g	1 g	29,00 EUR
PL-DPA-5g	5 g	109,00 EUR
PL-DPA-10g	10 g	145,00 EUR
PL-DPA-50g	50 g	508,00 EUR

n-Dodecylphosphonic acid, tech.

 $C_{12}H_{25}P(O)(OH)_2$ Purity: > 97% T_m >85°C

White to off-white powder

PL-DDPA-1g	1 g	25,00 EUR
PL-DDPA-5g	5 g	91,00 EUR
PL-DDPA-10g	10 g	121,00 EUR
PL-DDPA-50g	50 g	424,00 EUR

n-Tetradecylphosphonic acid, tech.

 $C_{14}H_{29}P(O)(OH)_2$ Purity: > 97% T_m >85°C White to off-white powder

PL-TDPA-1g	1 g	38,00 EUR
PL-TDPA-5g	5 g	145,00 EUR
PL-TDPA-10g	10 g	194,00 EUR
PL-TDPA-50g	50 g	678,00 EUR

n-Hexadecylphosphonic acid, tech.

 $C_{16}H_{33}P(O)(OH)_2$ Purity: > 97% T_m >85°C White to off-white powder

PL-HDPA-1g	1 g	36,00 EUR
PL-HDPA-5g	5 g	136,00 EUR
PL-HDPA-10g	10 g	182,00 EUR
PL-HDPA-50g	50 g	635,00 EUR

n-Octadecylphosphonic acid, tech.

 $C_{18}H_{37}P(O)(OH)_2$ Purity: > 97% T_m >85°C White to off-white powder

PL-ODPA-1g	1 g	48,00 EUR
PL-ODPA-5g	5 g	179,00 EUR
PL-ODPA-10g	10 g	239,00 EUR
PL-ODPA-50g	50 g	847,00 EUR

Latex beads, monodisperse

Latex beads are spherical monodisperse particles made of poly(methyl methacrylate) (PMMA), polystyrene (PS) or melamine formaldehyde (MF) as base material. Surface modification and fluorescent labeling are performed during the preparation of the particles preventing the leaching of the dye and changing of their surface chemistry. For each size range the particles in pristine form (without surface modification), with surface carboxylic group or fluorescent label or both can be synthesized. Beads of a specific size range or fluorescence can be synthesized upon request, just let us know about your requirements.

Size 1: ca. 0,25 µm

PMMA, pristine surface, not labeled; CV < 5%; 5 wt.% in water

PL-PMMA-1-5m	5 mL	150,00 EUR
PL-PMMA-1-10m	10 mL	200,00 EUR
PL-PMMA-1-20m	20 mL	300,00 EUR

PMMA, -COOH modified, λ_{ev} 465 nm / λ_{em} 480 nm; CV < 5%; 2,5 wt.% in water

PL-PMMA-1-CF5-5m	5 mL	350,00 EUR
PL-PMMA-1-CF5-10m	10 mL	480,00 EUR
PL-PMMA-1-CF5-20m	20 mL	600,00 EUR

PS, pristine surface, not labeled; CV < 5%; 5 wt.% in water

PL-PS-1-5m	5 mL	150,00 EUR
PL-PS-1-10m	10 mL	200,00 EUR
PL-PS-1-20m	20 mL	300,00 EUR

PS, -COOH modified, not labeled; CV < 5%; 5 wt.% in water

PL-PS-1-C-5m	5 mL	150,00 EUR
PL-PS-1-C-10m	10 mL	200,00 EUR
PL-PS-1-C-20m	20 mL	300,00 EUR

Size 3: ca. 1 µm

PMMA, -COOH modified, not labeled; CV < 5%; 5 wt.% in water

PL-PMMA-3-C-5m	5 mL	150,00 EUR
PL-PMMA-3-C-10m	10 mL	200,00 EUR
PL-PMMA-3-C-20m	20 mL	300,00 EUR

PS, pristine surface, not labeled; CV < 5%; 5 wt.% in water

PL-PS-3-5m	5 mL	150,00 EUR
PL-PS-3-10m	10 mL	200,00 EUR
PL-PS-3-20m	20 mL	300,00 EUR

Size 4: ca. 2 µm

PMMA, pristine surface, not labeled; CV < 5%; 5 wt.% in water

PL-PMMA-4-5m	5 mL	150,00 EUR
PL-PMMA-4-10m	10 mL	200,00 EUR
PL-PMMA-4-20m	20 mL	300,00 EUR

PS, pristine surface, not labeled; CV < 5%; 5 wt.% in water

PL-PS-4-5m	5 mL	150,00 EUR
PL-PS-4-10m	10 mL	200,00 EUR
PL-PS-4-20m	20 mL	300,00 EUR

MF, -NH₂ terminated, not labeled; CV < 5%; 5 wt.% in water

PL-MF-4-5m	5 mL	150,00 EUR
PL-MF-4-10m	10 mL	200,00 EUR
PL-MF-4-20m	20 mL	300,00 EUR

MF, -NH $_2$ terminated, $\lambda_{\rm ex}$ 410 nm / $\lambda_{\rm em}$ 515 nm; CV < 5%; 2,5 wt.% in water

PL-MF-4-G2-5m	5 mL	250,00 EUR
PL-MF-4-G2-10m	10 mL	350,00 EUR
PL-MF-4-G2-20m	20 mL	500,00 EUR

Size 5: ca. 5 µm

PMMA, pristine surface, not labeled; CV < 5%; 5 wt.% in water

PL-PMMA-5-5m	5 mL	150,00 EUR
PL-PMMA-5-10m	10 mL	200,00 EUR
PL-PMMA-5-20m	20 mL	300,00 EUR

Size 6: ca. 7 µm

PS, -COOH modified, $\lambda_{\rm ex}$ 440 nm / $\lambda_{\rm em}$ 475 nm; CV < 5%; 2,5 wt.% in water

PL-PS-6-CFG4-5m	5 mL	350,00 EUR
PL-PS-6-CFG4-10m	10 mL	480,00 EUR
PL-PS-6-CFG4-20m	20 mL	600,00 EUR

Size 7: ca. 10 µm

PS, pristine surface, not labeled; CV < 5%; 5 wt.% in water

PL-PS-7-5m	5 mL	150,00 EUR
PL-PS-7-10m	10 mL	200,00 EUR
PL-PS-7-20m	20 mL	300,00 EUR

48









You may use this form to order products. Please send it scanned per e-mail to shop@plasmachem.com or per fax +49 30 6392 6314 and we will send you the complete commercial offer.

	Order No.:	_	
	Catalogue Number	Description	Amount
1.			
2.			
3.			
4.			
5.			
6.			
	Delivery Address:	Billing Ad	ldress:
	notes: Name:	Signa	ature:







You can check shipment prices and save time through instant ordering and payment at our online shop: *https://shop.plasmachem.com*

	Order No.:						
	Catalogue Number	Description	Amount				
1.							
2.							
3.							
4.							
5.							
6.							
	Delivery Address:	Billing Address:					
	notes: Name:	Signatui	re:				

Terms and Conditions of Sale

All sales are subject to the following terms and conditions: Limited Warranties

Limitation of Liability/Purchaser's Indemnity ALL ORDERS ARE ACCEPTED AND SHIPPED STRICTLY SUBJECT TO THESE GENERAL TERMS AND CONDITIONS AND NO OTHER TERMS AND CONDITIONS PRINTED ON BUYER'S PURCHASE ORDER OR OTHERWISE, SHALL BE APPLICABLE TO YOUR ORDER.

Method of Shipment

Whenever possible, we will ship products by the method specified on your order. We work closely with Deutsche Post, FedEx, UPS, TNT, and DHL and find we can service you best when using these carriers. We will be happy to utilize other carriers based on your requirements; however, we must reserve the right to alter these instructions, in which case, we will select the most appropriate and cost effective method. Certain poisonous, reactive, corrosive or other chemicals may require a barrier bag, steel can, and/or other special packaging for shipment. There will be additional charges for these packages. Our Customer Service Representatives will advise you of the charges at the time the order is placed. We strive to minimize these costs through efficient packaging.

Terms and Prices

All orders are shipped FOB seller's shipping point. Your order may be subject to handling charges. We can also ship freight collect, if desired. All prices are listed in euros. PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. In cases where the selling prices have changed significantly, we will contact you for approval prior to shipping your mailed, faxed, or electronically-transferred order. OUR PAYMENT TERMS ARE NET 30 DAYS OF INVOICE, UNLESS OTHERWISE STATED. DELAYED PAYMENT IMPOSES A FINE of EUR 10.00 for the first reminder, which is sent after the payment deadline and EUR 20.00 for the second reminder, which is sent earliest 2 weeks after the first reminder.

Order Changes/Cancellations

No change by Purchaser of any term or condition of this contract or any of Seller's rights

or remedies hereunder shall be binding on Seller, nor shall the order hereby acknowledged be changed or cancelled by Purchaser unless approved in writing by an authorized person of PlasmaChem GmbH. There are no representations, agreements, promises, or understandings between Purchaser and Seller that are not expressed herein.

Claims for Lost or Damaged Shipments We urge you to inspect all packages immediately upon receipt and report any damage, shortage or defect to our Customer Service Department as soon as possible. CLAIMS FOR THESE DISCREPANCIES MUST BE MADE WITHIN 30 DAYS OF YOUR RECEIVING THE MATERIALS. All products are sold FOB seller's shipping point unless otherwise noted. Delivery of goods to the carrier at seller's plant or to other loading point shall constitute delivery to Buyer, and regardless of shipping terms, all risks of loss or damage in transit shall be borne by Buyer.

Return Shipments

Some materials are not returnable to PlasmaChem GmbH, including, but not limited to, custom or special order materials, leaking or damaged chemicals, items with missing or obliterated labels, parts or instructions, refrigerated or frozen materials and opened materials. Returned shipments cannot be accepted by PlasmaChem GmbH unless prior arrangements have been made. If it is necessary to return any materials, contact our representative to obtain a return authorization number. REQUESTS FOR RETURN AUTHORIZATION NUMBERS MUST BE MADE WITHIN 30 DAYS OF YOUR RECEI-VING THE MATERIALS. Only items authorized by seller for return will be accepted. Final disposition of returned goods will be made only after receipt and inspection of goods. Collect shipments will not be accepted unless previously authorized. Material must be received on or before the Return Authorization expiration date. Material returned requiring disposal may incur additional charges. A 20% restocking fee is charged on catalogue items returned, subject to a minimum charge of EUR 20,00 and a maximum charge of EUR 150,00.

Uses and Patents

Our materials are offered for laboratory and manufacturing use only. They are NOT intended for use as drugs, food additives, cosmetic, household chemicals, or other inappropriate applications. The listing of a material in this catalogue does not constitute a license to, or a recommendation for, its use in infringement of any patent. We reserve the right to limit sales of products or not to sell products to unqualified customers.

Limited Warranties

The information included in this catalogue has been obtained from normally reliable and dependable sources and is correct to the best of our knowledge; however, we cannot guarantee it as such. WE MAKE NO OTHER REPRESENTATIONS OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO OUR PRODUCTS, WHETHER USED ALONE OR IN CONNECTION WITH ANY OTHER SUBSTANCE.

Limited Liability/Purchaser's Indemnity

Claims for rejected, non-conforming product, or any other claim against us, must be made in writing and must be received and acknowledged by us in writing within thirty (30) days of customer's receipt of the product in question. Any claims not satisfying this condition shall be deemed waived. Upon the approved return of any such product, we shall have the option to replace such product with conforming product or to return the purchase price to customer, at our sole discretion. PURCHASER'S EXCLUSIVE REMEDY, FOR ANY CAUSE OR CLAIM WHATSOEVER, INCLUDING BUT NOT LIMITED TO ALLEGED BREACH OF WARRANTY, PRODUCT LIABILITY, NEGLI-GENCE. OR OTHERWISE. SHALL BE FOR MONEY DAMAGES IN AN AMOUNT NOT TO EXCEED THE PURCHASE PRICE PAID BY PURCHASER FOR THE PRODUCT IN RES-PECT TO WHICH THE CLAIM IS MADE. IN NO EVENT SHALL WE BE LIABLE FOR SPECIAL. INCIDENTAL OR CONSEQUENTIAL DAMA-GES, WHETHER PURCHASER'S CLAIM IN CONTRACT, NEGLIGENCE, STRICT LIABILI- TY OR OTHERWISE. IN CONSIDERATION OF THE SALE OF PRODUCT TO PURCHASER, WHICH SALES WE WOULD NOT OTHERWISE MAKE, PURCHASER AGREES TO INDEMNIFY AND HOLD US HARMLESS FROM ALL CLAIMS, EXPENSES, LOSSES AND LIABILITY OF ANY NATURE WHATSOEVER ARISING OUT OF PURCHASER'S HANDLING AND/OR USE OF PRODUCT, WHETHER USED ALONE OR IN COMBINATION WITH ANY OTHER SUBSTANCE.

Material Safety Data Sheets

Each shipment of chemicals and/or pure elements is accompanied by a Material Safety Data Sheet in compliance with OSHA Hazard Communication Standard. If one is not immediately available, a copy will be sent via mail as soon as possible. We strongly recommend that customers use this information to ensure proper use and that the health and safety of all are protected. We furnish the information on each Material Safety Data Sheet without warranty.

Hazards

All of our products should be handled only by qualified and trained individuals. In purchasing these products, the customer acknowledges that there are hazards associated with their use. Customer represents and warrants to us that from customer's own independent review and study it is fully aware and knowledgeable about (a) the health and safety hazards associated with the handling of the products purchased; (b) industrial hygiene controls necessary to protect its workers from such health and safety hazards; (c) the need to adequately warn of health and safety hazards associated with products; and (d) government regulations regarding the use of and exposure to such products.

D.I. to the line of the line o	demodeleev Constitution of the Constitution of	4,002602(2) Helium '1'4-1'5-1'5-1'5-1'5-1'5-1'5-1'5-1'5-1'5-1'5	16,9984032(s) 20,1797(s) Neon Neon Neon Neon Neon Neon Neon Neon	CI 18 Ar 453(2) 39,948(1) Argon	Wn 25 Fe 26 Co. 27 Ni 28 54,938045(2) 55,845(2) 55,93195(5) 58,6934(4) Manganese Iron Cobalt Nickel	35 Br 36 Kr 79,904(1) 83,798(2) Krypton	TC 43 Ru 44 Rh 45 Pd 46 101,07(2) 102.90550(2) 106,42(1) Technitium Rudium Palladium	53	Re 75 0	85 At 86 Rn (222) Radon	Bh 107 HS 108 PC (250) [272] [270] Hassium chemium		Dy 66 Ho 67 Er 68 Tm 75 T7 Lu 74 52500(1) 145,2002(2) 175,228(3) 165,3242(2) 175,054(8) 174,9688(1) 174,0688(1)		Of 36 ES 39 Fm 100 Md 101 No 102 Lr 103
SHUMBI	EEV	N N	7 8 0 9 14,0067(2) 15,9994(3) 18 Nitrogen Oxygen	15 P 16 S 17 30,973762(2) 32,065(5) 35 Phosphorus Sulfur	Cr 24 51,9961(6) Chromium	33 AS 34 Se 35 35 35 35 35 35 35 35 35 35 35 35 35	Nb 41 No 42 1 92,906(2) 95,906(2) Nobium Molybdenum T	51 Sb	W 74 183,84(1) Tungsten	83 Bi 84 PO 85 208,98040(1) [209] [21 Bismuth Polonium		LANTHANIDE SERIES	Gd 64 Tb 65 157,25(3) 158,92535(2) Terbium	NIDE SERIES	
100	MEN	ΛI	6 C 12,0107(8)	14 Si 1 28,0855(3) 3	21 Ti 22 (6) 47,867(1) Titanium	32 Ge 72,64(1) Germanium	Zr 40 91,224(2) Zirconium	50 Sn 118,710(7)	Hf 72 T 178,49(2) 1 Hafnium Ta	82 Pb 207,2(1) Lead	Rf 104 [265] Rutherfordium	LAN	61 Sm Eu 63 (1) 150,36(2) 151,964(1) Europium		93 Pu 94 Am 95
1 1 0 V T C 1 0 1 0 1	BY		Be 9,012182(3) 10,811(7) Beryllium Boron	Mg 12 13 Al 24,3050(6) 26,9815386(8) Aluminium	20 SC (4) 44,955912 Scandium	;38(2) Zinc 69,723(1) Gal	Sr 38	48 Cd 49 In 112,411(8) 114,818(3) Indium	Ba 56 La ⁵⁷ 137,327(7) Lu ⁷¹ Barium	80 Hg 81 TI 200,59(2) 204,3833(2) Thallium	Ra 8 AC 9- [226] Lr 103		Pr 59 Nd 60 Pm 61 140,90765(2) 1442,422(3) Prascodymium Neodymium Promethium		91 U 92 NP 93
-	I	1,00794(7) Hydrogen	2 Li 3 E 6,941(2)	3 Na 11 Sodium N Na Sodium N	19 39,0983(1) Potassium	29 Cu 30 65 63,546(3) 65 Copper	Rb 37 85,4678(3) Rubidium	47 Acg 48 107,8682(2) 11 Silver	55 (CS 132,9054519(2) Caesium	79 Au 80 196,966569(4) 20 Gold	7 Fr 87 [1223] Francium		Lanthanum Cerium Praseod		Ac 37 Th 90 Pa 91