

Silfluo® Semiconductor Materials

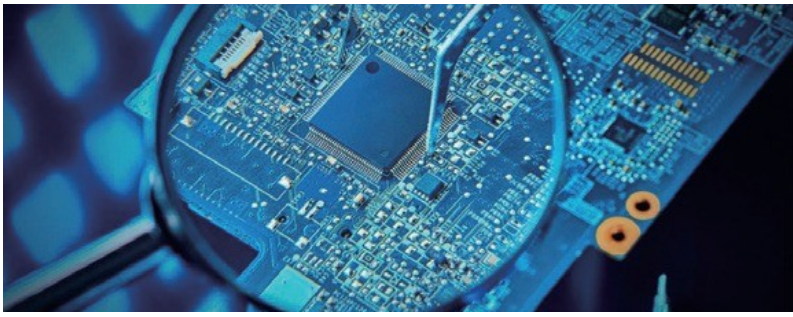
ALD · CVD · MOCVD precursors and electronic silanes

Nanjing Silfluo New Material Co., Ltd.

Silfluo

www.silfluosilicone.com





SEMICONDUCTOR AND ALD MATERIALS

Silfluo supplies silicon and metal precursors, MOCVD sources and functional silanes for thin-film deposition, epitaxy and electronic packaging.

This brochure lists 54 products in six groups. Each entry gives the English and Chinese name, formula, CAS number and structure. Products with an LS- code are Silfluo grades; the others are listed by their common abbreviation.

APPLICATIONS

Dielectric films

SiO_2, SiN_x, SiCN and SiOC low-k films; high-k ZrO_2, HfO_2 and Ta_2O_5

Barrier, electrode and metal films

TiN, TaN, Co, W and Pt by ALD and CVD

Epitaxy and polysilicon

Silicon epitaxy, polysilicon and SiC

Compound semiconductors

MOCVD of GaN, GaAs, InP and antimonide and telluride layers

Electronic packaging

Adhesion promoters for packaging materials, substrates and coatings

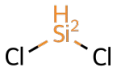
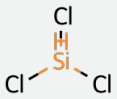
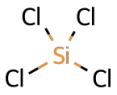
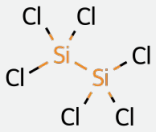
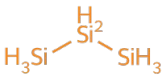
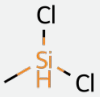
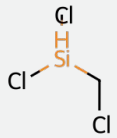
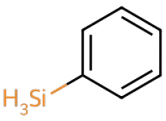
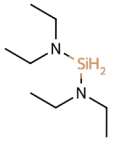
PRODUCT GROUPS		PAGE
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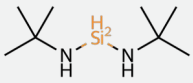
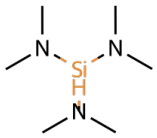
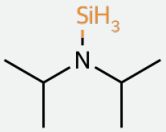
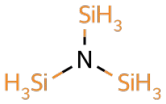
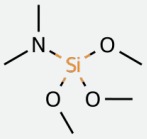
PURITY, DOCUMENTS AND PACKAGING

Each delivery comes with a COA; TDS and SDS are available on request. Purity grade, trace-metal limits and the container (cylinder, bubbler or ampoule and valve type) are agreed for each product and process.

TO QUOTE, PLEASE TELL US

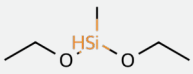
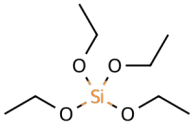
01 Product and process (ALD, CVD, MOCVD, epitaxy)
02 Purity and trace-metal specification
03 Container type, valve and fill quantity
04 Annual quantity

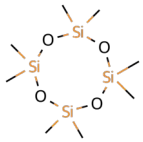
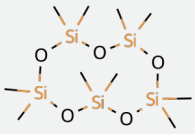
Code	Product	Formula	CAS	Structure
01	**CHLOROSILANES AND SILICON HYDRIDES**			
	Silicon sources for epitaxial and polycrystalline silicon, silicon nitride and silicon oxide films by CVD and ALD, and intermediates for silicon-containing precursors.			
DCS	**Dichlorosilane** 二氯二氢硅	SiH_2Cl_2 **High purity**	4109-96-0	
TCS	**Trichlorosilane** 三氯氢硅	$SiHCl_3$ **High purity**	10025-78-2	
STC	**Silicon tetrachloride** 四氯化硅	$SiCl_4$ **High purity**	10026-04-7	
HCDS	**Hexachlorodisilane** 六氯乙硅烷	Si_2Cl_6	13465-77-5	
TS3	**Trisilane** 丙硅烷	Si_3H_8	7783-26-8	
LS-MDCS	**Dichloromethylsilane** 甲基二氯硅烷	CH_3SiHCl_2 **97% min**	75-54-7	
DMCS	**Chlorodimethylsilane** 二甲基一氯硅烷	$(CH_3)_2SiHCl$ **98% min**	1066-35-9	
CMDCS	**(Chloromethyl)dichlorosilane** 氯甲基二氯硅烷	$ClCH_2SiHCl_2$	18170-89-3	
$PhSiH_3$	**Phenylsilane** 苯基硅烷	$C_6H_5SiH_3$	694-53-1	
02	**AMINOSILANES**			
	Chlorine-free silicon precursors for low-temperature ALD and CVD of silicon oxide, silicon nitride and silicon carbonitride films.			
BDEAS	**Bis(diethylamino)silane** 双（二乙氨基）硅烷	$SiH_2[N(C_2H_5)_2]_2$	27804-64-4	

Code	Product	Formula	CAS	Structure
BTBAS	**Bis(tert-butylamino)silane** 双（叔丁氨基）硅烷	$SiH_2[NHC(CH_3)_3]_2$	186598-40-3	
3DMAS	**Tris(dimethylamino)silane** 三（二甲氨基）硅烷	$SiH[N(CH_3)_2]_3$	15112-89-7	
DIPAS	**Diisopropylaminosilane** 二异丙氨基硅烷	$SiH_3N[CH(CH_3)_2]_2$	908831-34-5	
TSA	**Trisilylamine** 三甲硅烷基胺	$N(SiH_3)_3$	13862-16-3	
DMATMS	**(Dimethylamino)trimethoxysilane** （二甲氨基）三甲氧基硅烷	$(CH_3)_2NSi(OCH_3)_3$	116228-47-8	

03 METHYLSILANES, ALKOXYSILANES AND SILOXANES

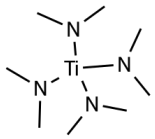
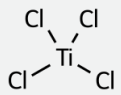
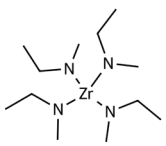
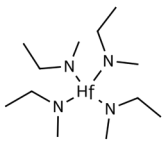
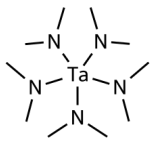
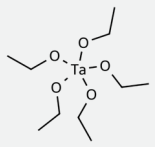
Precursors for silicon oxide, SiOC low-k and SiC films, and high-purity cyclic siloxanes.

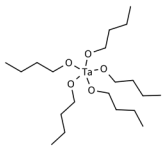
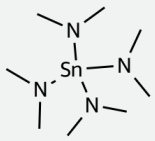
3MS	**Trimethylsilane** 三甲基硅烷	$(CH_3)_3SiH$	993-07-7	
4MS	**Tetramethylsilane** 四甲基硅烷	$Si(CH_3)_4$	75-76-3	
HMDS	**Hexamethyldisilane** 六甲基二硅烷	$(CH_3)_3SiSi(CH_3)_3$ **99% min**	1450-14-2	
LS-922	**Diethoxymethylsilane (DEMS)** 甲基二乙氧基硅烷	$CH_3SiH(OC_2H_5)_2$	2031-62-1	
TEOS	**Tetraethyl orthosilicate, high purity** 正硅酸乙酯（高纯）	$Si(OC_2H_5)_4$ **99.99%**	78-10-4	
LS-D4H	**1,3,5,7-Tetramethylcyclotetrasiloxane (TMCTS)** 1,3,5,7- 四甲基环四硅氧烷	$[CH_3SiH(O)]_4$	2370-88-9	

Code	Product	Formula	CAS	Structure
LS-D4	**Octamethylcyclotetrasiloxane (OMCTS, D4)** 八甲基环四硅氧烷	$[(CH_3)_2SiO]_4$	556-67-2	
LS-D5	**Decamethylcyclopentasiloxane (D5)** 十甲基环五硅氧烷	$[(CH_3)_2SiO]_5$	541-02-6	

04 METAL PRECURSORS FOR ALD AND CVD

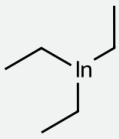
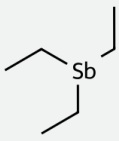
Amide, alkoxide, halide, carbonyl and cyclopentadienyl compounds for high-k dielectrics, barrier and electrode films and metal deposition.

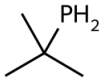
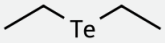
TDMAT	**Tetrakis(dimethylamino)titanium** 四（二甲氨基）钛	$Ti[N(CH_3)_2]_4$	3275-24-9	
$TiCl_4$	**Titanium tetrachloride** 四氯化钛	$TiCl_4$	7550-45-0	
TEMAZ	**Tetrakis(ethylmethylamino)zirconium** 四（乙基甲基氨基）锆	$Zr[N(CH_3)(C_2H_5)]_4$	175923-04-3	
CpZr	**Cyclopentadienyltris(dimethylamino)zirconium** 环戊二烯基三（二甲氨基）锆	$(C_5H_5)Zr[N(CH_3)_2]_3$	33271-88-4	
TEMAH	**Tetrakis(ethylmethylamino)hafnium** 四（乙基甲基氨基）铪	$Hf[N(CH_3)(C_2H_5)]_4$	352535-01-4	
CpHf	**Cyclopentadienyltris(dimethylamino)hafnium** 环戊二烯基三（二甲氨基）铪	$(C_5H_5)Hf[N(CH_3)_2]_3$	941596-80-1	
PDMAT	**Pentakis(dimethylamino)tantalum** 五（二甲氨基）钽	$Ta[N(CH_3)_2]_5$ **99.999% (5N)**	19824-59-0	
$Ta(OEt)_5$	**Tantalum(V) ethoxide** 乙醇钽	$Ta(OC_2H_5)_5$	6074-84-6	

Code	Product	Formula	CAS	Structure
$Ta(OBu)_5$	**Tantalum(V) n-butoxide** 正丁醇钽	$Ta(OC_4H_9)_5$	51094-78-1	
TDMASn	**Tetrakis(dimethylamino)tin** 四（二甲氨基）锡	$Sn[N(CH_3)_2]_4$	1066-77-9	
$W(CO)_6$	**Tungsten hexacarbonyl** 六羰基钨	$W(CO)_6$	14040-11-0	
$CpCo(CO)_2$	**Cyclopentadienylcobalt dicarbonyl** 二羰基环戊二烯基钴	$(C_5H_5)Co(CO)_2$	12078-25-0	
CCTBA	**(3,3-Dimethyl-1-butyne)dicobalt hexacarbonyl** （3,3- 二甲基 -1- 丁炔）六羰基二钴	$Co_2(CO)_6(HC{\equiv}CC(CH_3)_3)$	56792-69-9	
$MeCpPtMe_3$	**Trimethyl(methylcyclopentadienyl)platinum(IV)** 三甲基（甲基环戊二烯基）铂（IV）	$(CH_3C_5H_4)Pt(CH_3)_3$	94442-22-5	

05 MOCVD SOURCES FOR COMPOUND SEMICONDUCTORS

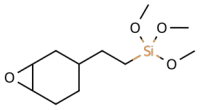
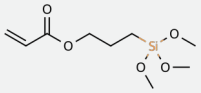
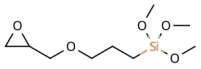
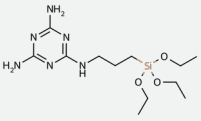
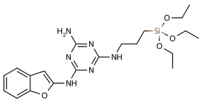
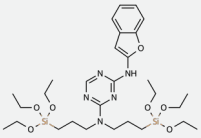
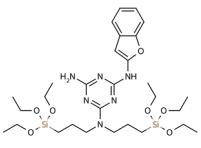
Metal-organic sources and dopants for III–V and II–VI compound semiconductors and phase-change materials.

TMA	**Trimethylaluminum** 三甲基铝	$Al(CH_3)_3$	75-24-1	
TMG	**Trimethylgallium** 三甲基镓	$Ga(CH_3)_3$	1445-79-0	
TMI	**Trimethylindium** 三甲基铟	$In(CH_3)_3$	3385-78-2	
TEIn	**Triethylindium** 三乙基铟	$In(C_2H_5)_3$ **> 99.9999%**	923-34-2	
TMSb	**Trimethylantimony** 三甲基锑	$Sb(CH_3)_3$	594-10-5	
TESb	**Triethylantimony** 三乙基锑	$Sb(C_2H_5)_3$ **99.9999%**	617-85-6	

Code	Product	Formula	CAS	Structure
TBP	**tert-Butylphosphine** 叔丁基膦	$(CH_3)_3CPH_2$	2501-94-2	
DETe	**Diethyltellurium** 二乙基碲	$Te(C_2H_5)_2$	627-54-3	
Cp_2Mg	**Bis(cyclopentadienyl)magnesium** 二茂镁	$Mg(C_5H_5)_2$	1284-72-6	
Cp_2Fe	**Bis(cyclopentadienyl)iron (ferrocene)** 二茂铁	$Fe(C_5H_5)_2$	102-54-5	

06 FUNCTIONAL SILANES FOR ELECTRONIC PACKAGING

Epoxy, acrylic and triazine silanes used as adhesion promoters in packaging materials, substrates and coatings.

LS-EH231	**2-(3,4-Epoxycyclohexyl)ethyltrimethoxysilane** 2-（3,4- 环氧环己基）乙基三甲氧基硅烷	$C_{14}H_{26}O_4Si$	3388-04-3	
LS-M304	**3-Acryloxypropyltrimethoxysilane** 3-（丙烯酰氧基）丙基三甲氧基硅烷	$C_9H_{18}O_5Si$	4369-14-6	
LS-E560	**3-Glycidoxypropyltrimethoxysilane** 3- 缩水甘油醚氧基丙基三甲氧基硅烷	$C_9H_{20}O_5Si$	2530-83-8	
—	**2,4-Diamino-6-[3-(triethoxysilyl)propylamino]-1,3,5-triazine** 2,4- 二氨基 -6-[3-（三乙氧基硅基）丙基氨基]-1,3,5- 三嗪	$C_{12}H_{26}N_6O_3Si$ 95%	93918-63-9	
—	**2-Amino-4-(benzofuran-2-ylamino)-6-[3-(triethoxysilyl)propylamino]-1,3,5-triazine** 2- 氨基 -4-（苯并呋喃 -2- 基氨基）-6-[3-（三乙氧基硅基）丙基氨基]-1,3,5- 三嗪	$C_{20}H_{30}N_6O_4Si$ 95%	—	
—	**N,N-Bis[3-(triethoxysilyl)propyl]-N′-(benzofuran-2-yl)-1,3,5-triazine-2,4-diamine** N,N- 双 [3-（三乙氧基硅基）丙基]-N′-（苯并呋喃 -2- 基）-1,3,5- 三嗪 -2,4- 二胺	$C_{29}H_{49}N_5O_7Si_2$ 95%	—	
—	**N,N-Bis[3-(triethoxysilyl)propyl]-N″-(benzofuran-2-yl)-1,3,5-triazine-2,4,6-triamine** N,N- 双 [3-（三乙氧基硅基）丙基]-N″-（苯并呋喃 -2- 基）-1,3,5- 三嗪 -2,4,6- 三胺	$C_{29}H_{50}N_6O_7Si_2$	—	

– : no Silfluo code yet, or no CAS number. No structure is drawn for the cyclopentadienyl and carbonyl compounds; see the formula.



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