

## Deuterated Tin Chlorides

Organotin compounds are widely applied in the industry due to their antibacterial and fungicidal properties.

Applications include preservation of wood, textiles, leather and paper, and as disinfectants.

Due to their toxicity the use of trialkyltin compounds in marine antifouling paints is restricted.

The trialkyltin compounds are partly degraded to the di- and monoalkyltin derivatives.



### New Internal standards for analysis of tinchlorides:

9126.4-K-IO	Mono-n-butyltin-d <sub>9</sub> trichloride,	CD <sub>3</sub> CD <sub>2</sub> CD <sub>2</sub> CD <sub>2</sub> -Sn <sup>3+</sup> , 3Cl <sup>-</sup>
9127.12-K-IO	Tri-n-butyl-d <sub>27</sub> chloride	(CD <sub>3</sub> CD <sub>2</sub> CD <sub>2</sub> CD <sub>2</sub> ) <sub>3</sub> -Sn <sup>+</sup> , Cl <sup>-</sup>
9129.6-K-IO	Monophenyltin-d <sub>5</sub> trichloride	C <sub>6</sub> D <sub>5</sub> -Sn <sup>3+</sup> , 3Cl <sup>-</sup>
9128.18-K-IO	Triphenyltin-d <sub>15</sub> chloride	(C <sub>6</sub> D <sub>5</sub> ) <sub>3</sub> -Sn <sup>+</sup> , Cl <sup>-</sup>

Available as 1000µg/mL in isooctane, 1 mL

### Useful internal standard in the derivatization with sodium tetraethyl borate and use in ISO methods 17353 and 23161:

Natives:	
CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> -Sn <sup>3+</sup> , 3Cl <sup>-</sup> (1983.4-K-5ME / 1G)	→ CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> -Sn-(CH <sub>2</sub> CH <sub>3</sub> ) <sub>3</sub> (2119.10-K-IO)
(CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> ) <sub>3</sub> -Sn <sup>+</sup> , Cl <sup>-</sup> (1981.12-K-5ME / 1G)	→ (CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> ) <sub>3</sub> -Sn-CH <sub>2</sub> CH <sub>3</sub> (1886.14-K-IO)
C <sub>6</sub> H <sub>5</sub> -Sn <sup>3+</sup> , 3Cl <sup>-</sup> (1987.6-K-5ME / 1G)	→ C <sub>6</sub> H <sub>5</sub> -Sn-(CH <sub>2</sub> CH <sub>3</sub> ) <sub>3</sub> (2118.12-K-IO)
(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> -Sn <sup>3+</sup> , Cl <sup>-</sup> (1985.18-K-5ME / 1G)	→ (C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> -Sn-CH <sub>2</sub> CH <sub>3</sub> (1887.20-K-IO)
Internal standards:	
CD <sub>3</sub> CD <sub>2</sub> CD <sub>2</sub> CD <sub>2</sub> -Sn <sup>3+</sup> , 3Cl <sup>-</sup> (9126.4-K-IO)	→ CD <sub>3</sub> CD <sub>2</sub> CD <sub>2</sub> CD <sub>2</sub> -Sn-(CH <sub>2</sub> CH <sub>3</sub> ) <sub>3</sub> (9229.10-100-IO)
(CD <sub>3</sub> CD <sub>2</sub> CD <sub>2</sub> CD <sub>2</sub> ) <sub>3</sub> -Sn <sup>+</sup> , Cl <sup>-</sup> (9127.12-K-IO)	→ (CD <sub>3</sub> CD <sub>2</sub> CD <sub>2</sub> CD <sub>2</sub> ) <sub>3</sub> -Sn-CH <sub>2</sub> CH <sub>3</sub> (9230.14-100-IO)
C <sub>6</sub> D <sub>5</sub> -Sn <sup>3+</sup> , 3Cl <sup>-</sup> (9129.6-K-IO)	→ C <sub>6</sub> D <sub>5</sub> -Sn-(CH <sub>2</sub> CH <sub>3</sub> ) <sub>3</sub> (9231.12-100-IO)
(C <sub>6</sub> D <sub>5</sub> ) <sub>3</sub> -Sn <sup>3+</sup> , Cl <sup>-</sup> (9128.18-K-IO)	→ (C <sub>6</sub> D <sub>5</sub> ) <sub>3</sub> -Sn-CH <sub>2</sub> CH <sub>3</sub> (9232.20-100-IO)

### International standard methods

- ISO 17353:2004 Water Quality - Determination of selected organotin compounds - Gas chromatographic method.
- ISO/DIS 23161.2:2007 Soil Quality - Determination of selected organotin compounds - Gas chromatographic method.

As a unique source, Chiron offers standards for the derived analytes for use as calibration standards, in addition to the derivatizing agent and the common trialkyltin chloride pollutants.



**PRODUCT OVERVIEW TINORGANICS:**

<b>Tin-organics</b>	
	<b>Tin chlorides (common pollutants)</b>
1983.4-K-5ME *	Mono-n-butyltin trichloride
1982.8-K-5ME *	Di-n-butyltin dichloride
1982.8-K-5IO	Di-n-butyltin dichloride
1981.12-K-5ME *	Tri-n-butyltin chloride
1981.12-K-5IO	Tri-n-butyltin chloride
2497.16-K-IO *	Tetra-n-butyltin
2487.8-K-ME *	Mono-n-octyltin trichloride
2488.16-K-ME *	Di-n-octyltin dichloride
2695.24-K-5ME	Tri-n-octyltin chloride
2695.24-100MG	Tri-n-octyltin chloride
1987.6-K-5ME *	Monophenyltin trichloride
1986.12-K-5ME *	Diphenyltin dichloride
1985.18-K-5ME *	Triphenyltin chloride
1985.18-K-5IO	Triphenyltin chloride
2489.18-500-ME *	Tricyclohexyltin chloride
2489.18-K-ME	Tricyclohexyltin chloride
1984.3-KIT-S	Butyltin chlorides Kit (solutions, 1983.4, 1982.8, 1981.12)
1984.3-KIT-N	Butyltin chlorides Kit (neat, 1983.4, 1982.8, 1981.12)
1988.3-KIT-S	Phenyltin chlorides Kit (solutions, 1987.6, 1986.12, 1985.18)
1988.3-KIT-N	Phenyltin chlorides Kit (neat, 1987.6, 1986.12, 1985.18)
3726.10-KIT	Tin Chlorides Kit I (neat, 1983.4, 1982.8, 1981.12, 1987.6, 1986.12, 1985.18, 2487.8, 2488.16, 2695.24, 2489.18, includes all tin chloride analytes)
	<b>Internal standards (tin chlorides and tetralkyl)</b>
1989.9-K-ME *	Tri-n-propyltin chloride
2050.15-K-ME *	Tri-n-pentyltin chloride
2490.12-K-IO *	Tetra-n-propyltin
3956.15-K-IO *	Tetra-n-pentyltin
2495.7-K-ME	Mono-n-heptyltin trichloride
2495.7-100MG	Mono-n-heptyltin trichloride
2495.7-K-IO	Mono-n-heptyltin trichloride
2496.14-K-ME	Di-n-heptyltin dichloride
2496.14-100MG	Di-n-heptyltin dichloride
2496.14-K-IO	Di-n-heptyltin dichloride
8556.14-KIT-S	Tin Chlorides Kit II (solutions, 1983.4, 1982.8, 1981.12, 1987.6, 1986.12, 1985.18, 2487.8, 2488.16, 2695.24, 2489.18, 1989.9, 2050.15, 3956.15, 2495.14, includes all tin chloride analytes and internal standards)
8556.14-KIT-N	Tin Chlorides Kit II (neat, 1983.4, 1982.8, 1981.12, 1987.6, 1986.12, 1985.18, 2487.8, 2488.16, 2695.24, 2489.18, 1989.9, 2050.15, 3956.15, 2495.14, includes all tin chloride analytes and internal standards)
	<b>Deuterated Internal Standard</b>
8554.12-K-IO	Tetra-n-propyltin-d7 (mono-n-propyl-d7)
8554.12-K-IOx5	Tetra-n-propyltin-d7 (mono-n-propyl-d7)
9126.4-K-IO	Mono-n-butyltin-d9 trichloride
9127.12-K-IO	Tri-n-butyltin-d27 chloride
9129.6-K-IO	Monophenyltin-d5 trichloride
9128.18-K-IO	Triphenyltin-d15 chloride
9229.10-100-IO	Mono-n-butyltriethyltin-d9 (mono-n-butyl-d9)
9230.14-100-IO	Ethyltri-n-butyltin-d27 (tri-n-butyl-d27)
9231.12-100-IO	Monophenyltriethyltin-d5 (phenyl-d5)
9232.20-100-IO	Ethyltriphenyltin-d15 (triphenyl-d15)
8555.19-S	Organotin Analytes + Internal Standards, Solutions Kit (19 compounds, 19 vials, includes 1944.8 as neat and 8554.12 in solution)
8555.19-N	Organotin Analytes + Internal Standards, Neat Kit (19 compounds, 19 vials, includes 1944.8 as neat and 8554.12 in solution)



	<b>Analytes ethyl derivatives</b>
2119.10-K-IO	Mono-n-butyltriethyltin
2120.12-K-IO	Di-n-butyl-diethyltin
1886.14-K-IO	Ethyltri-n-butyltin
2492.14-K-IO	Mono-n-octyltriethyltin
2491.20-K-IO	Di-n-octyl-diethyltin
8553.26-K-IO	Ethyltri-n-octyltin
2498.20-K-IO	Ethyltricyclohexyltin
2118.12-K-IO	Monophenyltriethyltin
2117.16-K-IO	Diphenyl-diethyltin
1887.20-K-IO	Ethyltriphenyltin
	<b>Internal standards ethyl derivatives</b>
1955.11-K-IO	Ethyltri-n-propyltin
2049.17-K-IO	Ethyltri-n-pentyltin
2494.13-K-IO	Mono-n-heptyltriethyltin
2493.18-K-IO	Di-n-heptyl-diethyltin
2023.14-KIT	Ethyl derivatives Kit (Ethylalkyl-/ Ethylaryl tin Kit)

\* Also available in 1 g amount.

All Tin Monochlorides have a limited shelf life of 4 months from date of purchase.

### Derivatizing Agent and Kits:

1944.8.1-1G	Sodium tetraethyl borate (Derivatizing agent), 1 g
8555.19-KIT-S	Organotin Analytes + Internal Standards, Solutions Kit (19 compounds, 19 vials, includes 1944.8 as neat)
8555.19-KIT-N	Organotin Analytes + Internal Standards, Neat Kit (19 compounds, 19 vials, includes 1944.8 as neat and 8554.12 in solution)
3726.10-KIT-N	Tin Chlorides Neat KIT I (includes Analytes but not Internal Standards)
8556.14-KIT-S	Tin Chlorides Neat KIT II (includes Internal Standards and Analytes in solution)
8556.14-KIT-N	Tin Chlorides Neat KIT II (includes Internal Standards and Analytes as neat)
2023.14-KIT	Ethyl derivatives Kit, Solutions
2024.33-KIT-S	Organotin Analysis Solutions KIT (includes all the compounds, includes 1944.8 as neat)
2024.33-KIT-N	Organotin Analysis Neat KIT (includes all the compounds, includes 1944.8 as neat)

See also BMF 24-2 for info on Deuterated alkyl - and aryltin compounds.

