3. CHEMICAL AND PHYSICAL INFORMATION

3.1 CHEMICAL IDENTITY

Table 3-1 lists common synonyms, trade names, and other pertinent identification information for thallium and a number of thallium compounds.

3.2 PHYSICAL AND CHEMICAL PROPERTIES

Table 3-2 lists important physical and chemical properties of thallium and selected thallium compounds.

TABLE 3-1. Chemical Identity of Thallium and Compounds[a]

Characteristic	Thallium	Thallium acetate	Thallium chloride	Thallium nitrate	Thallium oxide	Thallium sulfate
Synonyms	Ramor[b]	Thallous acetate; thallium (1+) salt	Thallic chloride	Thallous nitrate; nitric acid, thallium (1+) salt	Thallic oxide	Thallous sulfate
Trade name	No data	No data	No data	No data	No data	No data
Chemical formula	Tl	$TlC_2H_3O_2$	$TlCl_3$	$TlNO_3$	Tl_2O_3	Tl_2SO_4
Chemical structure	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Identification numbers:						
CAS Registry	7440-28-0	563-68-8	13453-32-2	10102-45-1	1314-32-5	7416-18-6
NIOSH RTECS	XG3425000[c]	AJ5425000[c]	No data	XG5950000[c]	XG2975000[c]	No data
EPA Hazardous Waste	No data	V214[b]	No data	V217[b]	P113[b]	No data
OHM/TADS	7216925[b]	7217306[b]	No data	No data	No data	No data
DOT/UN/NA/	UN1707[b]	UN1707[b]	No data	UN2727[b]	UN1707[b]	No data
IMCO Shipping	IMCO 6.1[b]	IMCO 6.1[b]	No data	IMCO 6.1[b]	IMCO 6.1[b]	No data
HSDB	4496[b]	855[b]	No data	No data	6055[b]	No data
NCI	No data	No data	No data	No data	No data	No data

TABLE 3-1 (Continued)

Characteristic	Thallium carbonate	Thallium bromide	Thallium iodide	Thallium fluoride
Synonyms	Thallous carbonate; carbonic acid; dithallium carbonate	Thallium monobromide; thallous bromide	Thallous iodide	Thallum monofluoride; Thallous fluoride
Trade name	No data	No data	No data	No data
Chemical formula	Tl_2CO_3	TlBr	TlI	TlF
Chemical structure	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Identification numbers:				
CAS Registry	6533-73-9	7789-40-0	7790-30-9	7789-27-7
NIOSH RTECS	XG4000000[c]	XG3850000[c]	XG5425000[c]	XG4900000[c]
EPA Hazardous Waste	V215[b]	No data	No data	No data
OHM/TADS	No data	No data	No data	No data
DOT/UN/NA/	UN1707[b]	No data	No data	No data
IMCO Shipping	IMCO6.1[b]	No data	No data	No data
NCI	No data	No data	No data	No data

[a]All information obtained from EPA 1988a, except where noted.
[b]HSDB 1989
[c]Sax 1984

CAS = Chemical Abstracts Service
DOT/UN/NA/IMCO = Department of Transportation/United Nations/North America/International Maritime Dangerous Goods Code
EPA = Environmental Protection Agency
HSDB = Hazardous Substances Data Bank
NCI = National Cancer Institute
NIOSH = National Institute for Occupational Safety and Health
OHM/TADS = Oil and Hazardous Materials/Technical Assistance Data System
RTECS = Registry of Toxic Effects of Chemical Substances

TABLE 3-2. Physical and Chemical Properties of Thallium and Compounds[a]

Property	Thallium	Thallium acetate	Thallium chloride	Thallium nitrate	Thallium oxide	Thallium sulfate
Molecular weight	204.38	263.43	310.74	266.39	456.76	504.82
Color	Blush-white	White	White[b]	White[b]	Colorless	Colorless
Physical state	Metal	Solid	Solid	Solid	Solid	Solid
Melting point	303.5°C	131°C	25°C	206°C[c]	717±5°C	632°C
Boiling point	1457±10°C	No data	Decomposes	430°C[c]	-20 at 875°C	Decomposes[c]
Density at 20°C	11.85	3.76 at 137°C	No data	5.5[b]	9.65-10.19 at 21°C	6.77
Odor	Odorless[d]	Odorless[d]	No data	Odorless[d]	No data	No data
Odor threshold:						
Water	No data	No data	No data	No data	No data	No data
Air	No data	No data	No data	No data	No data	No data
Solubility:						
Water at 20°C	Insoluble	Very soluble	Very soluble	95.5 g/L	Insoluble	48.7 g/L
Organic solvents	Soluble in nitric or sulfuric acid,	Very soluble in alcohol; insoluble in acetone	Soluble in alcohol and ether	Insoluble in alcohol; Soluble in acetone	Soluble in acids; Insoluble in alkalies	No data
Partition coefficients:						
Log octanol/water	No data	No data	No data	No data	No data	No data
Log K_{oc}	No data	No data	No data	No data	No data	No data
Vapor Pressure at 1000°C	10 mmHg[c]	No data	No data	No data	No data	No data
Henry's law constant	No data	No data	No data	No data	No data	No data
Autoignition temperature	No data	No data	No data	No data	No data	No data
Flashpoint	No data	No data	No data	No data	No data	No data
Flammability limits	No data	No data	No data	No data	No data	No data
Conversion factors	No data	No data	No data	No data	No data	No data

TABLE 3-2 (Continued)

Property	Thallium carbonate	Thallium bromide	Thallium iodide	Thallium fluoride
Molecular weight	468.78	284.29	331.29	223.38
Color	Colorless	Yellowish-white	Yellow red (at 170°C)	Colorless
Physical state	Solid	Solid	Solid	Solid
Melting point	273°C	480°C	440°C[c]	327°C
Boiling point	No data	815°C	824°C[c]	655°C
Density at 20°C	7.11	7.56 at 17.3°C	7.29	8.23 at 4°C
Odor	No data	No data	No data	No data
Odor threshold:				
Water	No data	No data	No data	No data
Air	No data	No data	No data	No data
Solubility:				
Water at 20°C	40.3 g/L at 15.5°C	0.5 g/L at 25°C	0.006 g/L	786 g/L at 15°C
Organic solvents	Insoluble in alcohol, ether, and acetone	Soluble in alcohol, insoluble in acetone	Insoluble in alcohol, slightly soluble in nitric acid	Slightly soluble in alcohol
Partition coefficients:				
Log octanol/water	No data	No data	No data	No data
Log K_{oc}	No data	No data	No data	No data
Vapor Pressure at 1000°C	No data	10 mmHg at 517°C[c]	No data	No data
Henry's law constant	No data	No data	No data	No data
Autoignition temperature	No data	No data	No data	No data
Flashpoint	No data	No data	No data	No data
Flammability limits	No data	No data	No data	No data
Conversion factors	No data	No data	No data	No data

[a]All information obtained from Weast 1985, except where noted.
[b]Windholz 1983
[c]EPA 1988a
[d]HSDB 1989