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Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and Related Compounds

Part I: Estimating Exposure to Dioxin-Like Compounds

Volume 1: Sources of Dioxin-Like Compounds in the United States

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LIST OF ACRONYMS

AHA	American Hospital Association
AISI	American Iron and Steel Institute
$AlCl_3$	Aluminum Chloride
AMSA	Association of Metropolitan Sewerage Agencies
APC	Air Pollution Control
APCD	Air Pollution Control Device
atm	Atmosphere
ATSDR	Agency for Toxic Substances and Disease Registry
BAAQMD	Bay Area Air Quality Management District
BCF	Bioconcentration Factor
BDDs	Polybrominated Dibenzo-p-dioxins or PBDDS
BDFs	Polybrominated Dibenzofurans or PBDFs
BHF	Bag House Filter
Btu	British Thermal Unit
CAA	Clean Air Act
$CaCl_2$	Calcium Chloride
CARB	California Air Resources Board
CBI	Confidential Business Information
°C	Degree Celsius
CD	Compact Disk
CDDs	Polychlorinated Dibenzo-p-dioxins or PCDDs
CDFs	Polychlorinated Dibenzofurans or PCDFs
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (also know as Superfund)
C-ESP	Cold-side Electrostatic Precipitator
CETRED	Combustion Emissions Technical Resource Document
CFR	Code of Federal Regulations
CSF	Confidential Statement of Formula
CKD	Cement Kiln Dust
Cl^-	Chloride
Cl_2	Dichloride
cm	Centimeters
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CRWQCB	California Regional Water Quality Control Board
CR	Confidence Rating
CuCl	Copper (Cupric) Chloride
$CuCl_2$	Copper (Cupric) Dichloride
D	Symbol for Congener Class: Dibenzo-p-dioxin
D	Symbol for di (i.e., Two Halogen Substitution)
DBF	Dibenzofuran
DCBz	Dichlorobenzene
DCI	Data Call-In

LIST OF ACRONYMS (continued)

DCP	Dichlorophenols
DHHS	U.S. Department of Health and Human Services
DL	Detection Limit
DOC	U.S. Department of Commerce
DOE	U.S. Department of Energy
d_p	Physical Diameter
dscm	Dry Standard Cubic Meter
DSI	Dry Sorbent Injection
EAF	Electric Arc Furnaces
EDC	Ethylene Dichloride
EEI	Edison Electric Institute
EF	Emission Factor
e.g.	For example
EGB	Electro Granular Bed
EIA	Energy Information Administration
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESP	Electrostatic Precipitator
F	Symbol for Congener Class: Dibenzofuran
FF	Fabric Filter
^oF	Degree Fahrenheit
FB-RDF	Fluidized Bed Refuse-Derived Fuel
FCEM	Field Chemical Emissions Measurement
$FeCl_2$	Ferric (Iron) Dichloride
$FeCl_3$	Ferric (Iron) Trichloride
FGD	Flue Gas Desulfurization
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
ft	Feet
ft^3	Cubic Feet
g	Gram
GAC	Granular Activated Carbon
GC-ECD	Gas Chromatography/Electron Capture Detector
GC-MS	Gas Chromatography/Mass Spectrometry
gplg	Grams Per Leaded Gallon
gpg	Gram Per Gallon
gr/dscf	Grains Per Dry Standard Cubic Foot
HAPs	Hazardous Air Pollutants
HCl	Hydrogen Chloride
HCBz	Hexachlorobenzene
HD	Heavy Duty
HDD	Polyhalogenated Dibenzo-p-Dioxins
HDF	Pollyhalogenated Dibenzofurans
H-ESP	Hot-side Electrostatic Precipitator
Hp	Symbol for Hepta (i.e., Seven Halogen Substitution)

LIST OF ACRONYMS (continued)

hr	Hour
HWI	Hazardous Waste Incineration
Hx	Symbol for Hexa (i.e., Six Halogen Substitution)
HxCB	Hexachlorobiphenyl
i.e.	That Is
ITC	U.S. International Trade Commission
IUPAC	International Union of Pure and Applied Chemistry
J	Joules
KCl	Potassium Chloride
kg	Kilogram
km	Kilometer
kW	Kilowatt
L	Liter
lb	Pound
LII	Liquid Injection Incinerator
LOQ	Limits of Quantitation
M	Symbol for Mono (i.e., One Halogen Substitution)
MACT	Maximum Achievable Control Technologies
MB	Mass Burn
MB-RC	Mass Burn Rotary Kiln
MB-REF	Mass Burn Refractory-Walled
MB-WW	Mass Burn Waterwall
MCBz	Monochlorobenzene
MCP	Monochlorophenol
$MgCl_2$	Magnesium Chloride
MgO	Magnesium Oxide
μg	Microgram
mg	Milligram
mm	Millimeter
mol	Mole (Unit of Substance)
MOD/EA	Modular Excess Air
MOD/SA	Modular Starved Air
MSW	Municipal Solid Waste
MSWI	Municipal Solid Waste Incinerator
MWI	Medical Waste Incineration
m^2	Square Meter
m^3	Cubic Meter
Na	Sodium
NA	Not Applicable
NaCl	Sodium Chloride
NaOCl	Soldium Hypochlorite
NATO	North Atlantic Treaty Organization
ng	Nanogram
NCASI	National Council of the Paper Industry for Air and Stream Improvement

LIST OF ACRONYMS (continued)

ND	Not Detected
NCEA	National Center for Environmental Assessment
NEG	Expected To Be Negligible or Non-existent
NESHAP	National Emission Standards for Hazardous Air Pollutants
$NiCl_2$	Nickel Chloride
NiO	Nickel Oxide
Nm^3	Standard Cubic Meter
NMOC	Nonmethane Organic Compounds
NR	Not Reported
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O	Symbol for Octa (i.e., Eight Halogen Substitution)
OAQPS	Office of Air Quality Planning and Standards
O_2	Molecular Oxygen
OH	Hydroxide ion
OMS	Office of Mobile Sources
OPP	Office of Pesticide Programs
OPPT	Office of Pollution Prevention and Toxics
ORD	Office of Research and Development
OSW	Office of Solid Waste
Pa	Pascals (i.e., Unit of Pressure)
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PBDDs	Polybrominated Dibenzo-p-dioxins or BDDs
PBDFs	Polybrominated Dibenzofurans or BDFs
PBS	Packed Bed Scrubber
PCA	Portland Cement Association
PCBs	Polychlorinated Biphenyls
PCDDs	Polychlorinated Dibenzo-p-dioxins or CDDs
PCDFs	Polychlorinated Dibenzofurans or CDFs
PCP	Pentachlorophenol
PCP-Na	Pentachlorophenate
PCT	Polychlorinated Terphenyl
Pe	Symbol for Penta (i.e., Five Halogen Substitution)
PeCB	Pentachlorobiphenyl
PeCBz	Pentachlorobenzene
pg	Picogram
PL	Public Law
PM	Particulate Matter
POM	Polycyclic Organic Matter
POTW	Publicly Owned Treatment Works
ppb	Parts Per Billion
ppm	Parts Per Million
ppmv	Parts Per Million (Volume Basis)

LIST OF ACRONYMS (continued)

ppq	Parts Per Quadrillion
ppt	Parts Per Trillion
ppt/v	Parts Per Trillion (Volume Basis)
PUF	Polyurethane Foam Plug
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QWASI	Quantitative Water Sediment Interaction
RCRA	Resource Conservation and Recovery Act
RDF	Refuse-Derived Fuel
RT	Residence Time
SAB	Science Advisory Board
sec	Second
SIC	Standard Industrial Code
$SiCl_4$	Silium Tetrachloride
SIPs	State Implementation Plans
SNUR	Significant New Use Rule
SO_2	Sulfur Dioxide
sq	Square
T	Symbol for Tetra (i.e., Four Halogen Substitution)
TCBz	Trichlorobenzene
TCDD	2,3,7,8-tetrachlorobidenzo-p-dioxin
TCDF	2,3,.7,8-tetrachlorobidenzofuran
TCLP	Toxicity Characteristic Leachate Procedure
TeCB	Tetrachlorobiphenyls
TeCP	Tetrachlorophenols
TEF	Toxicity Equivalency Factor
TEQ	Toxicity Equivalents
TEQ/yr	Toxicity Equivalents Per Year
$TiCl_4$	Titanium Tetrachloride
Tr	Symbol for Tri (i.e., Three Halogen Substitution)
TrCBs	Trichlorobiphenyls
TrCP	Trichlorophenols
TRI	Toxics Release Inventory
TSCA	Toxics Substances Control Act
2,4-D	2,4-Dichlorophenoxyacetic Acid
2,4-DB	4-(2,4-Dichlorophenoxy) Butyric Acid
2,4-DCP	2,4-Dichlorophenol
2,4-DP	2-(2,4-Dichlorophenoxy) Propionic Acid
2,4,5-T	2,4,5-Trichlorophenoxy (Phenoxy Herbicides)
2378	Halogen Substitutions in the 2,3,7,8 Positions
μg	Microgram
UK	United Kingdom
UNC	Uncontrolled
USDA	U.S. Department of Agriculture

USITC	U.S. International Trade Commissiion
USWAG	Utility Solid Wastes Activity Group
UV	Ultraviolet
VCM	Vinyl Chloride Monomer
v/v	Volume per Volume
WHO	World Health Organization
wk^{-1}	Per Week
WS	Wet Scrubber
yr	Year

SYMBOLS:

@	At
/	Per
μ	Micro
%	Percent
$\prec$	Less than
$\succ$	Greater than
$\preceq$	Less than or equal to
$\succeq$	Greater than or equal to
~	Difference