

# **Appendix C**

## **Basis of OSHA Carcinogen Listing for Individual Chemicals**



Under section 313, a chemical does not have to be counted towards threshold determinations and release and other waste management calculations if it is present in a mixture below a certain concentration. This is known as the section 313 “*de minimus*” concentration in mixture. When the section 313 rule was developed, EPA adopted the *de minimus* percentages from the Occupational Safety and Health Administration’s (OSHA) Hazard Communication Standards (29 CFR 1910.1900) because much of the information that industry would have relating to chemicals in mixtures would most likely be from the material safety data sheet (MSDS) on that mixture. The OSHA *de minimus* limitation is 0.1 percent if the chemical is a known or suspect carcinogen by virtue of appearing in one of three sources:

1. National Toxicology Program (NTP), “Annual Report on Carcinogens” (Latest Edition);
2. International Agency for Research on Cancer (IARC) “Monographs” (Latest Edition); or
3. 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

The *de minimus* limitation is 1.0 percent for chemicals that do not meet the above OSHA carcinogen criteria. The carcinogen designation in the list of chemicals relates to any chemical that the Agency determined met the above OSHA criteria for the 0.1 percent *de minimus* limitation. Certain metal compound categories have two *de minimus* limitations. For example, hexavalent chromium compounds and inorganic arsenic compounds meet the OSHA carcinogen criteria, while trivalent chromium compounds and organic arsenic do not meet the OSHA criteria.

Table C-1 shows the specific bases for which the individual chemical was designated as a known or suspect carcinogen. This list was updated for the 1999 TRI Public Data Release, based on a review of the most current NTP, IARC, and OSHA sources.



Table C-1 Basis of OSHA Carcinogen Listing for Individual Chemicals

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
Acetaldehyde	2B	P	–	Catechol	2B	–	–
Acetamide	2B	–	–	Chlordane	2B	–	–
2-Acetylaminofluorene	–	P	Z	Chlorendic acid	2B	P	–
Acrylamide	2A	P	–	p-Chloroaniline	2B	–	–
Acrylonitrile	2B	P	Z	Chloroform	2B	P	–
2-Aminoanthraquinone	–	P	–	Chloromethyl methyl ether	1	K	Z
4-Aminoazobenzene	2B	–	–	3-Chloro-2-methyl-1-propene	–	P	–
4-Aminobiphenyl	1	K	Z	Chlorophenols	2B	–	–
1-Amino-2-methylantraquinone	–	P	–	Chloroprene**	2B	P	–
Amitrole	2B	P	–	Chlorothalonil	2B	–	–
o-Anisidine	2B	–	–	p-Chloro-o-toluidine	2A	P	–
o-Anisidine hydrochloride	–	P	–	Chromium (VI) compounds	1	K	–
Arsenic and inorganic arsenic compounds	1	K*	Z	Cobalt and cobalt compounds	2B	–	–
Asbestos (friable)	1	K	Z	Creosote	2A	K	–
Atrazine**	–	–	–	p-Cresidine	2B	P	–
Benzene	1	K	Z	Cupferron	–	P	–
Benzidine	1	K	Z	2,4-D****	2B	–	–
Benzoic trichloride	2B	P	–	2,4-D butoxyethyl ester****	2B	–	–
Beryllium and beryllium compounds	1	P*	–	2,4-D butyl ester****	2B	–	–
Bis(chloromethyl)ether	1	K	Z	2,4-D chlorocrotyl ester****	2B	–	–
1,3-Butadiene	2A	K	–	2,4-D 2-ethylhexyl ester****	2B	–	–
1,2-Butylene oxide	2B	–	–	2,4-D 2-ethyl-4-methylpentyl ester****	2B	–	–
C.I. Acid Red 114	2B	–	–	2,4-Diaminoanisole	2B	–	–
C.I. Direct Black 38	2A	K	–	2,4-Diaminoanisole sulfate	–	P	–
C.I. Direct Blue 6	2A	K	–	4,4'-Diaminodiphenyl ether	2B	–	–
C.I. Direct Brown 95	2A	–	–	2,4-Diaminotoluene	2B	P	–
C.I. Food Red 5	2B	–	–	Diaminotoluene (mixed isomers)	2B	P	–
C.I. Solvent Yellow 3 (o-aminoazotoluene)	2B	P	–	1,2-Dibromo-3-chloropropane	2B	P	Z
C.I. Solvent Yellow 34 (Auramine)	2B	–	–	1,2-Dibromoethane	2A	P	–
Cadmium and cadmium compounds	1	K*	–	1,4-Dichlorobenzene	2B	P	–
Carbon tetrachloride	2B	P	–	Dichlorobenzene (mixed isomers)	2B	P	–

**Note:** The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, reported when in a mixture at a concentration level below the de minimus level of 0.1% has been updated, and this list reflects the update.

IARC: 1–The chemical is carcinogenic to humans; 2A–The chemical is probably carcinogenic to humans; 2B–The chemical is possibly carcinogenic to humans.

NTP: K–The chemical is known to be carcinogenic; P–The chemical may reasonably be anticipated to be carcinogenic.

OSHA: Z–The chemical appears at 29 CFR part 1910 Subpart Z.

\*Certain compounds.

\*\*IARC classification was recently downgraded and the chemical no longer meets the OSHA carcinogen criteria (effective for the 2000 reporting year).

\*\*\*NTP classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)

\*\*\*\*Chlorophenoxy herbicides (IARC 2B).

\*\*\*\*\*IARC classification meets OSHA carcinogen criteria (effective for the 2001 reporting year)



**Appendix C — Basis of OSHA Carcinogen Listing for Individual Chemicals**

**Table C-1 Basis of OSHA Carcinogen Listing for Individual Chemicals (continued)**

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
3,3'-Dichlorobenzidine	2B	P	Z	2,4-D propylene glycol butyl ether ester****	2B	-	-
3,3'-Dichlorobenzidine dihydrochloride	2B	P	-	2,4-D sodium salt****	2B	-	-
3,3'-Dichlorobenzidine sulfate	2B	P	-	Epichlorohydrin	2A	P	-
Dichlorobromomethane	2B	P	-	Ethyl acrylate	2B	-	-
1,2-Dichloroethane	2B	P	-	Ethyl benzene*****	2B	-	-
Dichloromethane	2B	P	-	Ethyleneimine	-	-	Z
trans-1,3-Dichloropropene	2B	-	-	Ethylene oxide	1	K	Z
1,3-Dichloropropylene	2B	P	-	Ethylene thiourea	2B	P	-
Dichlorvos	2B	-	-	Formaldehyde	2A	P	Z
Diepoxybutane	2B	P	-	Heptachlor	2B	-	-
Di-(2-ethylhexyl)phthalate	-	P	-	Hexachlorobenzene	2B	P	-
Diethyl sulfate	2A	P	-	alpha-Hexachlorocyclohexane	2B	P	-
Diglycidyl resorcinol ether	2B	P	-	Hexachloroethane	2B	P	-
Dihydrosafrole	2B	-	-	Hexamethylphosphoramide	2B	P	-
3,3'-Dimethoxybenzidine	2B	P	-	Hydrazine	2B	P	-
3,3'-Dimethoxybenzidine dihydrochloride	2B	P	-	Hydrazine sulfate	-	P	-
3,3'-Dimethoxybenzidine hydrochloride	2B	P	-	Lead and inorganic lead compounds	2B	-	Z
4-Dimethylaminoazobenzene	2B	P	Z	Lindane	2B	P	-
3,3'-Dimethylbenzidine	2B	P	-	Mecoprop****	2B	-	-
3,3'-Dimethylbenzidine dihydrochloride	2B	P	-	Methoxone****	2B	-	-
3,3'-Dimethylbenzidine dihydrofluoride	2B	P	-	Methoxone sodium salt****	2B	-	-
Dimethylcarbamyl chloride	2A	P	-	4,4-Methylenebis (2-chloroaniline)	2A	P	-
N,N-Dimethylformamide**	-	-	-	4,4'-Methylenebis (N,N-dimethyl) benzeneamine	2B	P	-
1,1-Dimethylhydrazine	2B	P	-	4,4'-Methylenedianiline	2B	P	Z
Dimethyl sulfate	2A	P	-	Michler's ketone	-	P	-
2,4-Dinitrotoluene	2B	-	-	Mustard gas	1	K	-
2,6-Dinitrotoluene	2B	-	-	alpha-Naphthylamine	-	-	Z
1,4-Dioxane	2B	P	-	beta-Naphthylamine	1	K	Z
1,2-Diphenylhydrazine	-	P	-	Nickel	2B	P	-
2,4-D isopropyl ester****	2B	-	-	Nickel compounds	1	P*	-
2,4-DP****	2B	-	-	Nitriilotriacetic acid	-	P	-

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**Table C-1 Basis of OSHA Carcinogen Listing for Individual Chemicals (continued)**

Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
Nitrobenzene	2B	–	–	7,12-Dimethylbenz(a)anthracene	2B	–	–
4-Nitrobiphenyl	–	–	Z	Indeno[1,2,3-cd]pyrene	2B	P	–
Nitrofen	2B	P	–	5-Methylchrysene	2B	P	–
Nitrogen mustard	2A	–	–	1-Nitropyrene	2B	P	–
2-Nitropropane	2B	P	–	Potassium bromate	2B	–	–
N-Nitrosodi-n-butylamine	2B	P	–	Propane sultone	2B	P	–
N-Nitrosodiethylamine	2A	P	–	beta-Propiolactone	2B	P	Z
N-Nitrosodimethylamine	2A	P	Z	Propyleneimine	2B	P	–
N-Nitrosodi-n-propylamine	2B	P	–	Propylene oxide	2B	P	–
N-Nitroso-N-ethylurea	2A	P	–	Saccharin (manufacturing)**	–	–	–
N-Nitroso-N-methylurea	2A	P	–	Safrole	2B	P	–
N-Nitrosomethylvinylamine	2B	P	–	Sodium o-phenylphenoxide	2B	–	–
N-Nitrosomorpholine	2B	P	–	Styrene	2B	–	–
N-Nitrosornicotine	2B	P	–	Styrene oxide	2A	–	–
N-Nitrosopiperidine	2B	P	–	Tetrachloroethylene	2B	P	–
Pentachlorophenol	2B	–	–	Thioacetamide	2B	P	–
Phenytoloin	2B	P	–	4,4'-Thiodianiline	2B	–	–
Polychlorinated alkanes (C12, 60% chlorinated)	–	P	–	Thiourea	2B	P	–
Polybrominated biphenyls (PBBs)	2B	P	–	Toluene-2,4-diisocyanate	2B	P	–
Polychlorinated biphenyls (PCBs)	2A	P	–	Toluene-2,6-diisocyanate	2B	P	–
Polycyclic aromatic compounds (PACs):				Toluene diisocyanate (mixed isomers)	2B	P	–
Benz(a)anthracene	2A	P	–	o-Toluidine	2A	P	–
Benzo(b)fluoranthene	2B	P	–	o-Toluidine hydrochloride	–	P	–
Benzo(j)fluoranthene	2B	P	–	Toxaphene	2B	P	–
Benzo(k)fluoranthene	2B	P	–	Trichloroethylene	2A	P	–
Benzo(rst)pentaphene	2B	–	–	2,4,6-Trichlorophenol	2B	P	–
Benzo(a)pyrene	2A	P	–	1,2,3-Trichloropropane	2A	P	–
Dibenz(a,h)acridine	2A	P	–	Tris(2,3-dibromopropyl) phosphate	2A	P	–
Dibenz(a,j)acridine	2B	P	–	Trypan blue	2B	–	–
Dibenzo(a,h)anthracene	2B	P	–	Urethane	2B	P	–
7H-Dibenzo(c,g)carbazole	2B	P	–	Vinyl acetate	2B	–	–
Dibenzo(a,e)pyrene	2B	P	–	Vinyl bromide	2A	–	–
Dibenzo(a,h)pyrene	2B	P	–	Vinyl chloride	1	K	Z
Dibenzo(a,l)pyrene	2B	P	–	2,6-Xylidine	2B	–	–

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