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

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## Appendix C

# Basis of OSHA Carcinogen Listing for Individual Chemicals

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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 Editions);
2. International Agency for Research on Cancer (IARC) "Monographs" (Latest Editions);
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. In addition, there are no *de minimus* levels for persistent bioaccumulative toxic (PBT) chemicals, except for supplier notification purposes. See Chapter 3 for more information on PBT chemicals.

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 *2001 TRI Public Data Release Report*, based on a review of the most current NTP, IARC, and OSHA sources.



## Appendix C – Basis of OSHA Carcinogen Listing for Individual Chemicals

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

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

**Note:** The list of TRI chemicals meeting the OSHA carcinogen standard and, therefore, not 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.

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

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Chemical	IARC	NTP	OSHA-Z	Chemical	IARC	NTP	OSHA-Z
Diethyl sulfate	2A	P	–	Lead and inorganic lead compounds	2B	–	Z
Diglycidyl resorcinol ether	2B	P	–	Lindane	2B	P	–
Dihydrosafrole	2B	–	–	Mecoprop**	2B	–	–
3,3'-Dimethoxybenzidine	2B	P	–	Methoxone**	2B	–	–
3,3'-Dimethoxybenzidine dihydrochloride	2B	P	–	Methoxone sodium salt**	2B	–	–
3,3'-Dimethoxybenzidine hydrochloride	2B	P	–	4,4'-Methylenebis (2-chloroaniline)	2A	P	–
4-Dimethylaminoazobenzene	2B	P	Z	4,4'-Methylenebis (N,N-dimethyl) benzeneamine	2B	P	–
3,3'-Dimethylbenzidine	2B	P	–	4,4'-Methylenedianiline	2B	P	Z
3,3'-Dimethylbenzidine dihydrochloride	2B	P	–	Michler's ketone	–	P	–
3,3'-Dimethylbenzidine dihydrofluoride	2B	P	–	Mustard gas	1	K	–
Dimethylcarbamyl chloride	2A	P	–	alpha-Naphthylamine	–	–	Z
1,1-Dimethylhydrazine	2B	P	–	beta-Naphthylamine	1	K	Z
Dimethyl sulfate	2A	P	–	Nickel	2B	P	–
2,4-Dinitrotoluene	2B	–	–	Nickel compounds	1	P*	–
2,6-Dinitrotoluene	2B	–	–	Nitrilotriacetic acid	–	P	–
1,4-Dioxane	2B	P	–	Nitrobenzene	2B	–	–
1,2-Diphenylhydrazine	–	P	–	4-Nitrobiphenyl	–	–	Z
2,4-D isopropyl ester**	2B	–	–	Nitrofen	2B	P	–
2,4-DP**	2B	–	–	Nitrogen mustard	2A	–	–
2,4-D propylene glycol butyl ether ester**	2B	–	–	2-Nitropropane	2B	P	–
2,4-D sodium salt**	2B	–	–	N-Nitrosodi-n-butylamine	2B	P	–
Epichlorohydrin	2A	P	–	N-Nitrosodiethylamine	2A	P	–
Ethyl acrylate	2B	–	–	N-Nitrosodimethylamine	2A	P	Z
Ethyl benzene	2B	–	–	N-Nitrosodi-n-propylamine	2B	P	–
Ethyleneimine	–	–	Z	N-Nitroso-N-ethylurea	2A	P	–
Ethylene oxide	1	K	Z	N-Nitroso-N-methylurea	2A	P	–
Ethylene thiourea	–	P	–	N-Nitrosomethylvinylamine	2B	P	–
Formaldehyde	2A	P	Z	N-Nitrosomorpholine	2B	P	–
Heptachlor	2B	–	–	N-Nitrosornicotine	2B	P	–
Hexachlorobenzene	2B	P	–	N-Nitrosopiperidine	2B	P	–
alpha-Hexachlorocyclohexane	2B	P	–	Pentachlorophenol	2B	–	–
Hexachloroethane	2B	P	–	Phenytion	2B	P	–
Hexamethylphosphoramide	2B	P	–	Polybrominated biphenyls (PBBs)	2B	P	–
Hydrazine	2B	P	–	Polychlorinated alkanes (C <sub>12</sub> , 60% chlorinated)	–	P	–
Hydrazine sulfate	–	P	–	Polychlorinated biphenyls (PCBs)	2A	P	–

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Polycyclic aromatic compounds (PACs):				Sodium o-phenylphenoxide	2B	–	–
Benz(a)anthracene	2A	P	–	Styrene	2B	–	–
Benzo(b)fluoranthene	2B	P	–	Styrene oxide	2A	–	–
Benzo(j)fluoranthene	2B	P	–	Tetrachloroethylene	2B	P	–
Benzo(k)fluoranthene	2B	P	–	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1	K	–
Benzo(rst)pentaphene	2B	–	–	Thioacetamide	2B	P	–
Benzo(a)pyrene	2A	P	–	4,4'-Thiodianiline	2B	–	–
Dibenz(a,h)acridine	2A	P	–	Thiourea	–	P	–
Dibenz(a,j)acridine	2B	P	–	Toluene-2,4-diisocyanate	2B	P	–
Dibenzo(a,h)anthracene	2B	P	–	Toluene-2,6-diisocyanate	2B	P	–
7H-Dibenzo(c,g)carbazole	2B	P	–	Toluene diisocyanate (mixed isomers)	2B	P	–
Dibenzo(a,e)pyrene	2B	P	–	o-Toluidine	2A	P	–
Dibenzo(a,h)pyrene	2B	P	–	o-Toluidine hydrochloride	–	P	–
Dibenzo(a,l)pyrene	2B	P	–	Toxaphene	2B	P	–
7,12-Dimethylbenz(a)anthracene	2B	–	–	Trichloroethylene	2A	P	–
Indeno[1,2,3-cd]pyrene	2B	P	–	2,4,6-Trichlorophenol	2B	P	–
5-Methylchrysene	2B	P	–	1,2,3-Trichloropropane	2A	P	–
1-Nitropyrene	2B	P	–	Tris(2,3-dibromopropyl)phosphate	2A	P	–
Potassium bromate	2B	–	–	Trypan blue	2B	–	–
Propane sultone	2B	P	–	Urethane	2B	P	–
beta-Propiolactone	2B	P	Z	Vinyl acetate	2B	–	–
Propyleneimine	2B	P	–	Vinyl bromide	2A	–	–
Propylene oxide	2B	P	–	Vinyl chloride	1	K	Z
Safrole	2B	P	–	2,6-Xylidine	2B	–	–

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