

New Jersey Department of Environmental Protection
 Division of Air Quality
 Bureau of Technical Services
 Air Quality Evaluation Section

REFERENCE CONCENTRATIONS FOR INHALATION
 August 2009

	H A P	CAS No.	Chemical Name	Reference Concentration (ug/m ³)	Reference	Comment
1	*	75070	Acetaldehyde	9	IRIS	
2		67641	Acetone	31000	ATSDR 08	See comment 1.
3		75865	Acetone cyanohydrin	60	USEPA 09	
4	*	75058	Acetonitrile	60	IRIS	
5	*	98862	Acetophenone	0.02	HEAST 92	
6	*	107028	Acrolein	0.02	IRIS	
7	*	79107	Acrylic acid	1	IRIS	
8	*	107131	Acrylonitrile	2	IRIS	
9	*	107051	Allyl chloride	1	IRIS	
10		7664417	Ammonia	100	IRIS	
11	*	62533	Aniline	1	IRIS	
12	**	1309644	Antimony trioxide	0.2	IRIS	
13	*		Arsenic and compounds	0.015	Cal 08	
14	**	7784421	Arsine	0.05	IRIS	
15	*	71432	Benzene	30	IRIS	
16	*		Beryllium	0.02	IRIS	
17		7440428	Boron (elemental)	20	HEAST 97	
18		7637072	Boron trifluoride	0.7	HEAST 97	
19	*	106990	Butadiene (1,3-)	2	IRIS	
20	*		Cadmium and compounds	0.02	Cal 08	
21	*	75150	Carbon disulfide	700	IRIS	
22	*	56235	Carbon tetrachloride	40	Cal 08	
23	*	57749	Chlordane (technical)	0.7	IRIS	Also CAS 12789036
24	*	7782505	Chlorine	0.2	Cal 08	
25		10049044	Chlorine dioxide	0.2	IRIS	
26	*	532274	Chloroacetophenone (2-)	0.03	IRIS	
27	*	108907	Chlorobenzene	1000	Cal 08	
28		75683	Chloro-1,1-difluoroethane (1-)	50000	IRIS	HCFC-142b
29		75456	Chlorodifluoromethane	50000	IRIS	HCFC-22
30		76062	Chloropicrin	0.4	Cal 08	
31	*	126998	Chloroprene	7	HEAST 97	2-Chloro-1,3-butadiene
32		75296	Chloropropane (2-)	100	HEAST 97	
33	**		Chromic acid mists (Cr VI)	0.008	IRIS	
34	**		Chromium VI dissolved aerosols	0.008	IRIS	
35	**		Chromium VI particulates	0.1	IRIS	
36	*		Cobalt	0.006	USEPA 09	
37	*	1319773	Cresol mixtures	600	Cal 08	
38	*	98828	Cumene	400	IRIS	
39	*	96128	Dibromo-3-chloropropane (1,2-)	0.2	IRIS	
40		95501	Dichlorobenzene (1,2-)	200	HEAST 97	
41	*	106467	Dichlorobenzene (1,4-)	800	IRIS	
42		75718	Dichlorodifluoromethane	200	HEAST 97	
43	*	542756	Dichloropropene (1,3-)	20	IRIS	
44	*	62737	Dichlorvos	0.5	IRIS	
45		77736	Dicyclopentadiene	7	USEPA 09	

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46			Diesel engine emissions	5	IRIS	
47	*	111422	Diethanolamine	3	Cal 08	
48	**	112345	Diethylene glycol monobutyl ether	20	USEPA 09	
49		75376	Difluoroethane (1,1-)	40000	IRIS	HCFC-152a
50	*	68122	Dimethylformamide (N,N-)	30	IRIS	
51	*	106898	Epichlorohydrin	1	IRIS	
52	*	106887	Epoxybutane (1,2-)	20	IRIS	
53	*	106934	Ethylene dibromide	0.8	Cal 08	1,2-Dibromoethane
54	*	107062	Ethylene dichloride	400	Cal 08	1,2-Dichloroethane
55	*	107211	Ethylene glycol	400	Cal 08	
56		111762	Ethylene glycol monobutyl ether	13000	IRIS	
57	**	110805	Ethylene glycol monoethyl ether	200	IRIS	2-Ethoxyethanol
58	**	109864	Ethylene glycol monomethyl ether	20	IRIS	2-Methoxyethanol
59	**	110496	Ethylene glycol monomethyl ether acetate	90	Cal 08	
60	*	75218	Ethylene oxide	30	Cal 08	
61	*	75343	Ethylidene dichloride	500	HEAST 97	1,1-Dichloroethane
62		16984488	Fluoride	13	Cal 08	
63	*	50000	Formaldehyde	9	Cal 08	
64		98011	Furfural	50	HEAST 97	
65			Gasoline vapors	15	NE 89	
66		111308	Glutaraldehyde	0.08	Cal 08	
67		765344	Glycidaldehyde	1	HEAST 97	
68	*	77474	Hexachlorocyclopentadiene	0.2	IRIS	
69	*	822060	Hexamethylene diisocyanate	0.01	IRIS	
70	*	110543	Hexane (n-)	700	IRIS	
71	*	302012	Hydrazine	0.2	Cal 08	
72	*	7647010	Hydrogen chloride	20	IRIS	Hydrochloric acid
73	**	74908	Hydrogen cyanide	3	IRIS	
74	*	7664393	Hydrogen fluoride	14	Cal 08	
75		7783064	Hydrogen sulfide	2	IRIS	
76	*	78591	Isophorone	2000	Cal 09	
77	*	108316	Maleic anhydride	0.7	Cal 08	
78	*		Manganese and compounds	0.05	IRIS	
79	*		Mercury (elemental)	0.3	IRIS	
80		126987	Methacrylonitrile	0.7	HEAST 97	
81	*	67561	Methanol	4000	Cal 08	
82	*	74839	Methyl bromide	5	IRIS	Bromomethane
83	*	74873	Methyl chloride	90	IRIS	Chloromethane
84	*	71556	Methyl chloroform	1000	Cal 08	1,1,1-Trichloroethane
85		108872	Methylcyclohexane	3000	HEAST 97	
86	*	75092	Methylene chloride	400	Cal 08	Dichloromethane
87	*	101774	Methylenedianiline (4,4'-)	20	Cal 08	
88	*	101688	Methylenediphenyl diisocyanate (4,4'-)	0.6	IRIS	
89		78933	Methyl ethyl ketone	5000	IRIS	
90	*	624839	Methyl isocyanate	1	Cal 08	
91	*	80626	Methyl methacrylate	700	IRIS	
92		25013154	Methyl styrene (mixed isomers)	40	HEAST 97	
93	*	1634044	Methyl tert-butyl ether	3000	IRIS	MTBE
94	*		Mineral fibers (<1% free silica)	24	Cal 05	See comment 2.
95	*	91203	Naphthalene	3	IRIS	
96	*		Nickel and compounds (except NiO)	0.05	Cal 08	Excludes nickel oxide.
97	**	1313991	Nickel oxide	0.1	Cal 08	

	H A P	CAS No.	Chemical Name	Reference Concentration (ug/m ³)	Reference	Comment
98	**		Nickel, soluble salts	0.2	TERA 99	See comment 3.
99		88744	Nitroaniline (o-)	0.1	USEPA 09	
100	*	98953	Nitrobenzene	9	IRIS	
101	*	79469	Nitropropane (2-)	20	IRIS	
102	*	108952	Phenol	200	Cal 08	
103	*	75445	Phosgene	0.3	IRIS	
104	*	7803512	Phosphine	0.3	IRIS	
105	*	7664382	Phosphoric acid	10	IRIS	
106	*		Phosphorus (white)	0.07	Cal 05	
107	*	85449	Phthalic anhydride	20	Cal 08	
108	*	123386	Propionaldehyde	8	IRIS	
109		115071	Propylene	3000	Cal 08	
110	*	78875	Propylene dichloride	4	IRIS	1,2-Dichloropropane
111	*	107982	Propylene glycol monomethyl ether	2000	IRIS	
112	*	75569	Propylene oxide	30	IRIS	
113	*		Selenium and compounds	20	Cal 08	Not hydrogen selenide.
114		7631869	Silica (crystalline, respirable)	3	Cal 08	
115	*	1004725	Styrene	1000	IRIS	
116		7664939	Sulfuric acid	1	Cal 08	
117	*	127184	Tetrachloroethylene	35	Cal 08	Perchloroethylene
118		811972	Tetrafluoroethane (1,1,1,2-)	80000	IRIS	
119	*	7550450	Titanium tetrachloride	0.1	ATSDR 08	
120	*	108883	Toluene	5000	IRIS	
121	*	584849	Toluene diisocyanate (2,4-)	0.07	IRIS	
122		91087	Toluene diisocyanate (2,6-)	0.07	IRIS	
123	*	26471625	Toluene diisocyanate (2,4/2,6-)	0.07	IRIS	Mixture
124	*	120821	Trichlorobenzene (1,2,4-)	4	USEPA 09	
125	*	79016	Trichloroethylene	600	Cal 08	
126		75694	Trichlorofluoromethane	700	HEAST 97	
127		76131	Trichloro-1,2,2-trifluoroethane (1,1,2-)	30000	HEAST 97	Freon 113
128	*	121448	Triethylamine	7	IRIS	
129	*	108054	Vinyl acetate	200	IRIS	
130	*	593602	Vinyl bromide	3	IRIS	Bromoethene
131	*	75014	Vinyl chloride	100	IRIS	
132	*	75354	Vinylidene chloride	200	IRIS	1,1-Dichloroethylene
133	*		Xylene (m-, o-, p-, or mixed)	100	IRIS	

Note:

All of the reference concentrations are to be compared with long-term (maximum annual average) ambient air concentrations.

Reference Concentration – An estimate (with uncertainty spanning about an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of adverse health effects during a lifetime.

HAP – Asterisk (*) indicates that this chemical is on the 1990 Clean Air Act Amendments list of hazardous air pollutants. Double asterisk (**) indicates that this chemical is part of a group listed in the 1990 Clean Air Act Amendments list of hazardous air pollutants (HAPs).

CAS No. - Chemical Abstract Service identification number.

References

- ATSDR 08 Agency for Toxic Substances and Disease Registry, "Minimal Risk Levels (MRLs) for Hazardous Substances," December 2008 (www.atsdr.cdc.gov/mrls/index.html) (chronic MRLs).
- Cal 05 California Air Resources Board (ARB), "Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values," 4/25/05 version.
- Cal 08 California Office of Environmental Health Hazard Assessment (OEHHA), "All OEHHA Acute, 8-hour and Chronic Reference Exposure Levels as of December 2008" (www.oehha.ca.gov/air/allrels.html).
- Cal 09 California Air Resources Board (ARB), "Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values," updated 2/9/09; (www.arb.ca.gov/toxics/healthval/healthval.htm).
- HEAST 92 USEPA Health Effects Assessment Summary Tables, Annual Update 1992, March 1992.
- HEAST 97 USEPA Health Effects Assessment Summary Tables, FY-1997 Update, July 1997.
- IRIS USEPA Integrated Risk Information System, as of April 2009 (www.epa.gov/iris).
- NE 89 NESCAUM Air Toxics Committee, Evaluation of the Health Effects from Exposure to Gasoline and Gasoline Vapors, August 1989.
- TERA 99 Toxicology Excellence for Risk Assessment, Toxicological Review of Soluble Nickel Salts, March 1999.
- USEPA 09 USEPA Regional Screening Level Table (summary table), April 2009 (www.epa.gov/reg3hwmd/risk/human/index.htm).

Comments

1. ATSDR values are "chronic" MRLs, based on an exposure duration of 365 days or longer.
2. Specifically, man-made fibers of glasswool, rockwool, slagwool, ceramic, & fine mineral.
3. The following compounds are among those considered to be "soluble nickel salts" (CAS numbers are in parentheses): Ni acetate (373-02-4); Ni acetate tetrahydrate (6018-89-9); Ni ammonium sulfate (7785-20-8); Ni carbonate (333-67-3); Ni chloride (7718-54-9); Ni chloride hexahydrate (7791-20-0); Ni fluoride (10028-18-9); Ni fluoroborate (14708-14-6); Ni formate (3349-06-2); Ni hydroxide (12054-48-7); Ni nitrate (13138-45-9); Ni sulfamate (13770-89-3); Ni sulfate (7786-81-4); Ni sulfate hexahydrate (10101-97-0); Ni sulfide (16812-54-7).