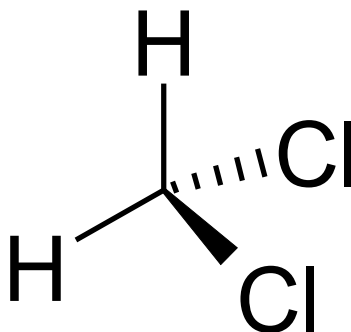# Final Risk Evaluation for Methylene Chloride

Systematic Review Supplemental File:

Data Extraction Tables for Consumer and Environmental Exposure Studies

CASRN: 75-09-2

June 2020

Monitoring Data Extracted for Methylene Chloride for Indoor Air, Personal Breathing Zone, Surface Water, and Wastewater

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
Indoor Air (μg/m³)											
US	CA (five regions)	*Commercial/Public* Commercial buildings (n= 37), 1 m from floor: Fleet service / Gas station convenience store, Dentist office / Healthcare facility, Grocery / Restaurant, Hair salon / Gym, Office, Miscellaneous, Retail	2011	40 (1)	1.68	ND to 17.1	NR (mean); 0.83 (GM)	--	1062239	(Wu et al., 2011)	High
US	CA	*School* Early childhood education facilities (n=34) at sample height of 1 m.	2010-2011	34 (0.03)	0.36	0.36 to 0.5	0.36 (mean); 0.36 (median)	1.3	3453092	(Hoang et al., 2016)	High
US	Detroit, MI area	*Residential* Homes (n=126) with children with asthma	2009-2010	126 (0.06)	0.71	ND to 7.85	0.54 (mean); 0.71 (median)	0.91	2443355	(Chin et al., 2014)	High
US	Boston, MA	*Residential* Garage of residences	2004-2005	16 (0.25)	0.39 to 1.25	ND to 147 (95th)	9.8 (mean); 0.3 (median)	36	1065844	(Dodson et al., 2008)	High
US	Boston, MA	*Residential* Apartment hallway of residences	2004-2005	10 (0.2)	0.39 to 1.25	ND to 15 (95th)	2.6 (mean); 0.4 (median)	4.6	1065844	(Dodson et al., 2008)	High
US	Boston, MA	*Residential* Basement of residences	2004-2005	52 (0.42)	0.39 to 1.25	ND to 0.66 (95th)	9.5 (mean); 0.4 (median)	28	1065844	(Dodson et al., 2008)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
US	Boston, MA	*Residential* Interior room of residences	2004-2005	83 (0.4)	0.39 to 1.25	ND to 10 (95th)	0.28 (mean); 0.21 (median)	8.7	1065844	(Dodson et al., 2008)	High
US	NR	*Commercial/Public* (Near Source: printmaking) Printmaking art studio at a university (n =1). Mechanically vented second-floor studio, with area samples collected near a cleaning station and in the middle of the studio during a printmaking session.	2002	18 (NR)	NR	NR	27.2 (mean); 9.6 (median)	0.5	49414	(Ryan et al., 2002)	High
US	NR	*Commercial/Public* Non-art related floor at a university, three floors above a printmaking floor with separate ventilation (n =1). Area samples collected from hallway.	2002	18 (<1)	NR	ND to NR	0.2 (mean); 0.25 (median)	0.9	49414	(Ryan et al., 2002)	High
US	Los Angeles, CA	*Residential* Homes (n=32) in inner-city neighborhood, sampled in the fall	2000	32 (1)	0.22	0.2 to 4.3	1.4 (mean); 1.1 (median)	1.2	1066049	(Sax et al., 2004)	High

| Country | State/City/Region | Site | Year | No. of Samples (Det. Freq.) | Detection Level | Concentration | | | Reference (HERO ID) | | Data Eval. Score |
						Range	Central Tendency	Standard Deviation	HERO	Citation	
US	Los Angeles, CA	*Residential* Homes (n=40) in inner-city neighborhood, sampled in the winter	2000	40 (0.95)	0.27	0.27 to 8.7	2.4 (mean); 1.9 (median)	2	1066049	(Sax et al., 2004)	High
US	Minneapolis, MN	*Residential* Indoors in the child's primary residence, during the spring.	2000	113 (0.20)	NR	ND to 1.2 (90th)	NR (mean); 0.3 (median)	--	632310	(Adgate et al., 2004)	Medium
US	Minneapolis, MN	*Residential* Indoors in the child's primary residence, during the winter.	2000	113 (0.23)	NR	ND to 1.3 (90th)	NR (mean); 0.4 (median)	--	632310	(Adgate et al., 2004)	Medium
US	Minneapolis, MN	*School* Indoors in five randomly selected classrooms in each school, during the spring.	2000	113 (0.02)	NR	NR	NR (mean); 0.3 (median)	--	632310	(Adgate et al., 2004)	Medium
US	Minneapolis, MN	*School* Indoors in five randomly selected classrooms in each school, during the winter.	2000	113 (0.02)	NR	NR	NR (mean); 0.4 (median)	--	632310	(Adgate et al., 2004)	Medium
US	New York, NY	*Residential* Homes (n=30) in inner-city neighborhood, sampled in the summer	1999	30 (0.28)	1.63	1.63 to 176	10 (mean); 1.4 (median)	32.9	1066049	(Sax et al., 2004)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
US	New York, NY	*Residential* Homes (n=36) in inner-city neighborhood, sampled in the winter	1999	36 (0.97)	0.22	0.2 to 69	5.5 (mean); 2.2 (median)	12.3	1066049	(Sax et al., 2004)	High
US	Southeast Chicago	*Residential* Urban homes (n=10) sampled over a 10-month period. Stationary samples were collected from the kitchen in the breathing zone.	1994-1995	48 (1)	NR	0.76 to 1190	140 (mean); 60.5 (median)	235	31210	(Van Winkle and Scheff, 2001)	High
US	Denver, CO	*Residential* VOCs from homes, pre-occupancy (n=8)	1994	9 (0.78)	0.14	0.14 to NR	2.64 (mean); 1.57 (median)	2.63	78782	(Lindstrom et al., 1995)	Medium
US	Los Angeles, CA	*Residential* Homes (n=8), sampled in living area during the summer	1987	NR	NR	NR to 14	5.6 (mean)	1.4	4727403	(Wallace et al., 1991)	Medium
CA	NR	*Residential* Homes (n=6), main floor	1987	6 (1)	NR	4 to NR	26.9 (mean); NR (median)	--	27974	(Chan et al., 1990)	Medium
CA	NR	*Residential* Homes (n=12), main floor	1986	12 (0.92)	NR	ND to NR	9.1 (mean); NR (median)	--	27974	(Chan et al., 1990)	Medium
SA	Kuwait	*Residential* Houses (n=20), sampled from living room	1998	226 (0.66)	0.26	ND to NR	NR (mean)	1.36	1744157	(Bouhamra and Elkilani, 1999)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
CN	NR	*Commercial/Public* Non-office premises (n=10) including one library, one social services center, two customer services centers, two shopping malls, two recreational building units, one reception area and one training center under renovation. 1.1 m above the floor level.	1998-2000	10 (0.9)	0.2	ND to 35.8	14.1 (mean); 10.7 (median); 7.41 (GM)	9.6	824555	(Chao and Chan, 2001)	Medium
CN	Metropolitan area	*Commercial/Public* Restaurants (n=4) in urban area, ventilated using central air-conditioning systems. Samples collected during dinner or lunch in main seating area.	2000	16 (1)	0.2	0.9 to 139	7.1 (mean); NR (median)	--	1642248	(Lee et al., 2001)	Medium
CN	Southern China	*Commercial/Public* New hotels (n=13), sampled from 1 meter above floor	2006-2007	13 (NR)	NR	NR to 34	10 (mean); NR (median)	4.53	1978790	(Chan et al., 2011)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
CN	Beijing	*Residential* 50 residences during the heating season (December 2011) and 50 residences during the non-heating season (April/May 2012).	2011-2012	100 (NR)	NR	NR to 780	12.5 (mean); 4.05 (median); (GM)	--	3449449	(Duan et al., 2016)	High
CN	Shanghai	*Residential* Eight residences that had been renovated within the previous year. Three sampling sites were used in each participating residence (the living room, bedroom, and study).	2015	8 (NR)	NR	NR	47.43 (mean); 15.48 (median)	--	3453725	(Dai et al., 2017)	High
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=30), sampled from bedrooms	1995	238 (1)	NR	0.769 to 1790	108 (mean); NR (median); 36.1 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=30), sampled from bathrooms.	1995	117 (1)	NR	0.75 to 1030	56.2 (mean); NR (median); 22.3 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=30), sampled from living rooms	1995	237 (1)	NR	1.13 to 2280	112 (mean); NR (median); 33.1 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=30), sampled from kitchens.	1995	116 (1)	NR	1.46 to 1950	109 (mean); NR (median); 34.6 (GM)	--	3545469	(Amagai et al., 1999)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=13), samples collected from living rooms	1995	51 (1)	NR	2.57 to 341	58.1 (mean); NR (median); 35 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=13), samples collected from kitchens	1995	51 (1)	NR	3.81 to 368	62.6 (mean); NR (median); 38.7 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=13), samples collected from bedrooms	1995	50 (1)	NR	1.04 to 305	55.7 (mean); NR (median); 35.4 (GM)	--	3545469	(Amagai et al., 1999)	Medium
JP	Katsushika Ward, Tokyo	*Residential* Houses (n=13), sampled from bathrooms.	1995	51 (1)	NR	2.79 to 294	46 (mean); NR (median); 31.5 (GM)	--	3545469	(Amagai et al., 1999)	Medium
Personal Breathing Zone ($\mu g/m^3$)											
US	NR	*Commercial/Public (Near Source: printmaking)* 12 students and 1 faculty member in university art (printmaking) studio. Mechanically ventilated second-floor.	2002	90 (NR)	NR	NR	4.9 (mean); 2.6 (median)	8.4	49414	(Ryan et al., 2002)	High
US	Minneapolis, MN	*Residential* In personal breathing zones, during the spring.	2000	113 (0.17)	NR	NR	0.3 (median)	--	632310	(Adgate et al., 2004)	Medium

| Country | State/City/Region | Site | Year | No. of Samples (Det. Freq.) | Detection Level | Concentration | | | Reference (HERO ID) | | Data Eval. Score |
						Range	Central Tendency	Standard Deviation	HERO	Citation	
US	Minneapolis, MN	*Residential* In personal breathing zones, during the winter.	2000	113 (0.19)	NR	NR	0.4 (median)	--	632310	(Adgate et al., 2004)	Medium
US	Minneapolis-St. Paul, MN	*General* Adults, non-smoking (n=70) living in three neighborhoods: (inner-city/economically disadvantaged, blue-collar/near manufacturing plants, and affluent)	1999	333 (1)	NR	NR	6.7 (mean); 1.4 (median)	--	730121	(Sexton et al., 2007)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Department Stores (n=10).	2004	5 (NR)	2.55	ND to 10.5	2.04 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Drug Stores (n= 8)	2003	7 (NR)	2.55	ND to 9.67	2.31 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Electronics Stores (n=9)	2004	7 (NR)	2.55	ND to 4.75	1.06 (GM)	--	2442846	(Loh et al., 2006)	High

| Country | State/City/Region | Site | Year | No. of Samples (Det. Freq.) | Detection Level | Concentration | | | Reference (HERO ID) | | Data Eval. Score |
						Range	Central Tendency	Standard Deviation	HERO	Citation	
US	Greater Boston Metropolitan Area	*Commercial/Public* Furniture Stores (n=11)	2003	6 (NR)	2.55	ND to 14.5	1.275 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Grocery Stores (n=16)	2003	12 (NR)	2.55	ND to 6.13	1.275 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Hardware Stores (n=32)	2003-2004	23 (NR)	2.55	4.17 to 123	11.12 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Home Stores (n=16)	2003	7 (NR)	2.55	ND to 3.64	1.275 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Multipurpose Stores (n=24)	2003-2005	15 (NR)	2.55	ND to 9.36	3.97 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Sporting Goods Stores (n=14)	2003	7 (NR)	2.55	ND to 7.45	1.275 (GM)	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Dining Stores (n=20)	2004	20 (NR)	2.55	ND to 90.3	NR	--	2442846	(Loh et al., 2006)	High
US	Greater Boston Metropolitan Area	*Commercial/Public* Transportation Stores (n=5)	2003-2004	21 (NR)	2.55	ND to 1.46	1.275 (GM)	--	2442846	(Loh et al., 2006)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
Surface Water (µg/L)											
US	NR	*Background* Nation-wide; Surface water for drinking water sources (rivers and reservoirs)	1999-2000	375 (0.0027)	0.2	ND to 2.6	NR	NR	3975046	(USGS, 2003)	Medium
US to CL	NR	*Background* Eastern Pacific Ocean (California, US to Valparaiso, Chile)	1979-1981	30 (0.93)	0.0004	ND to 0.008	0.0031 (mean); NR (median)	0.0032	29192	(Singh et al., 1983)	Medium
BR	NR	*Background* Santo Antonio da Patrulha, Tres Coroas, and Parobe in the Sinos River Basin; River samples collected from seven points on the three main rivers of the Sinos River Basin	2012-2013	60 (0.72)	NR	ND to 0.0058	0.0019 (mean)	NR	3489827	(Bianchi et al., 2017)	Medium
CN	NR	*Background* Daliao River (n=20 sites), heavily industrialized	2011	20 (0.75)	0.675	ND to 4.47	0.678 (mean)	NR	3488897	(Ma et al., 2014)	High
EU	NR	*Background* Estuaries of the Scheldt, Thames, Loire, Rhine	1997-1999	73 (1)	NR	0.0003 to 4.98	NR	NR	3242836	(Christof et al., 2002)	High

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
FR	NR	*Background* Paris; River samples (raw) collected from the River Seine (n=14 stations), River Marne (n=1 station) and River Oise (n=1 station). Wastewater treatment plants are located on the river.	1994-1995	43 (1)	NR	0.016 to 4.92	1.004 (mean); 0.473 (median)	1.218	3587944	(Duclos et al., 2000)	Medium
JP	NR	*Background* Osaka; Rivers and estuaries (30 sites) in industrialized city	1993-1995	136 (NR)	NR	NR to 134	1.7 (median)	NR	645789	(Yamamoto et al., 1997)	High
Wastewater (ug/L)											
IR	NR	*Near Facility (WWTP for automotive manufacturing industry)* Influent wastewater	2012	15 (NR)	NR	NR	64 (mean)	12	2667557	(Abtahi et al., 2013)	Medium
IR	NR	*Near Facility (WWTP for automotive manufacturing industry)* Effluent following treatment by flow equalization basin, primary sedimentation tank, conventional activated sludge process	2012	15 (0)	NR	ND	--	--	2667557	(Abtahi et al., 2013)	Medium
KR	Nation-wide	*Near Facility (industrial WWTPs)* Influent/Effluent	2012	81	1	1 to 120	5 (median)	--	3580141	(Lee et al., 2015)	Medium

Country	State/City/Region	Site	Year	No. of Samples (Det. Freq.)	Detection Level	Concentration			Reference (HERO ID)		Data Eval. Score
						Range	Central Tendency	Standard Deviation	HERO	Citation	
KR	Nation-wide	*Near Facility (industrial WWTPs)* Effluent	2012	81	1	ND	--	--	3580141	(Lee et al., 2015)	Medium

Study Info: The information provided includes the HERO ID and citation; country and year samples collected; number of samples and detection frequency.

[1]This study reported variation as standard error instead of standard deviation.

Abbreviations: If a value was not reported, it is shown in this table as "--"; ND = not detected at the reported detection limit; GM = geometric mean; DF = detection frequency; NR = Not reported; SE = Standard Error.

The following abbreviations are for countries/continents: BR = Brazil; CA = Canada; CL = Chile; CN = China; EU = Europe; FR = France; IR = Iran; JP = Japan; KR = Korea; SA = Saudi Arabia; US = United States.

Parameters: All statistics are shown as reported in the study. All minimum values determined to be less than the detection limit are shown in this table as "ND". If a maximum value was not provided, the highest percentile available is shown (as indicated in parentheses); if a minimum value was not provided, the lowest percentile available is shown (as indicated in parentheses).

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