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*Supplement of*

# Levels of persistent organic pollutants (POPs) in the Antarctic atmosphere over time (1980 to 2021) and estimation of their atmospheric half-lives

**Thais Luarte et al.**

*Correspondence to:* Thais Luarte (thaisluarte@gmail.com) and Cristóbal J. Galbán-Malagón (cristobal.galban@umayor.cl)

Table S.1. Reported atmospheric levels for the OCPs isomers reviewed. HCB (Hexachlorobenzene), α-HCH ( a isomer of hexachlorocyclohexane, b-hch (b isomer of hexachlorocyclohexane), γ-HCH (y isomer of hexachlorocyclohexane), 4,4'-DDT (4 4' diclorodyphenyl trichloroethane), 2,4'-DDT ( 2 4' diclorodyphenyl trichloroethane), 4,4' DDE (4, 4' Dichlorodyphenyl dichloroethylene), 2,4 (2,4 Dichlorodyphenyl dichloroethylene), 4,4' DDD (4,4' diclorodyphenyl dichloroethane), 2,4' (2,4'- diclorodyphenyl dichloroethane). ND: Not detected, NR: Not reported, BDL: Below detection limit, LOQ: Limit of quantification

| Year | HCB | α-HCH | β-HCH | γ-HCH | 4,4'-DDT | 2,4'-DDT | 4,4'-DDE | 2,4-DDE | 4,4'-DDD | 2,4'-DDD | Reference |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | - | ND | ND | ND | ND | ND | ND | ND | 0.29 | ND | Baek et al. 2011 |
| 2006 | - | 2.5 | 0.12 | 1.03 | ND | ND | 0.4 | ND | ND | ND | Baek et al. 2011 |
| 2006 | - | 1.98 | ND | 0.72 | ND | ND | ND | ND | ND | ND | Baek et al. 2011 |
| 2006 | - | 2.36 | ND | 0.7 | ND | ND | ND | ND | ND | ND | Baek et al. 2011 |
| 2007 | - | 1.72 | ND | ND | ND | ND | ND | ND | ND | ND | Baek et al. 2011 |
| 1990 | NR | 4.8 | - | 5 | NA | - | NA | - | - | - | Bidleman et al. 1993 |
| 1990 | NR | 4 | - | 1.7 | 1.1 | - | 0.64 | - | - | - | Bidleman et al. 1993 |
| 1990 | NR | 4.7 | - | 6 | 0.089 | - | 0.43 | - | - | - | Bidleman et al. 1993 |
| 1990 | 40 | 3.3 | - | 1.4 | 0.38 | - | 0.17 | - | - | - | Bidleman et al. 1993 |
| 1990 | 78 | 3.3 | - | 1.1 | <0.2 | - | 0.25 | - | - | - | Bidleman et al. 1993 |
| 1990 | NR | 2.7 | - | 1.6 | NA | - | NA | - | - | - | Bidleman et al. 1993 |
| 1990 | 70 | 3.6 | - | 5.6 | 0.35 | - | 0.17 | - | - | - | Bidleman et al. 1993 |
| 1990 | NR | 4.4 | - | 16.9 | 0.58 | - | 0.51 | - | - | - | Bidleman et al. 1993 |
| 1990 | NR | 6.7 | - | 13 | 0.72 | - | 0.54 | - | - | - | Bidleman et al. 1993 |
| 2014 | - | <0.13 | <0.065 | 2.23 | ND | <0.91 | <0.15 | ND | ND | <0.72 | Bigot et al., 2016 |
| 2014 | - | <0.23 | <0.032 | 2.8 | <0.61 | <0.91 | 0.44 | <0.099 | <0.49 | <0.39 | Bigot et al., 2016 |
| 2014 | - | <0.33 | <0.059 | 3.15 | ND | <2.73 | 0.15 | <0.15 | <0.38 | <0.41 | Bigot et al., 2016 |
| 2014 | - | <0.80 | <0.37 | 4.34 | <7.79 | <0.99 | <0.78 | <0.51 | <1.77 | <1.62 | Bigot et al., 2016 |
| 2014 | - | 0.93* | <0.76 | 2.48 | <5.30 | ND | <0.15 | <0.15 | <0.67 | <0.62 | Bigot et al., 2016 |
| 2014 | - | <0.31 | <0.030 | 3.36 | NR | NR | <0.15 | ND | NR | <0.60 | Bigot et al., 2016 |
| 2014 | - | NR | NR | NR | NR | NR | NR | NR | NR | NR | Bigot et al., 2016 |
| 2014 | - | <0.15 | <0.079 | <0.70 | <0.67 | <1.04 | nd | <0.15 | nd | <0.39 | Bigot et al., 2016 |
| 2014 | - | <0.44 | <0.23 | 2.88* | <3.44 | nd | <0.15 | <0.30 | <0.54 | <1.22 | Bigot et al., 2016 |
| 2014 | - | <1.11 | <0.69 | 1.93 | ND | ND | ND | ND | ND | <0.39 | Bigot et al., 2016 |
| 2014 | - | <0.30 | <0.10 | 2.35 | ND | ND | ND | ND | ND | ND | Bigot et al., 2016 |
| 2003 | - | 0.21 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2003 | - | 0.35 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2003 | - | 0.25 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2003 | - | 0.17 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2003 | - | 0.17 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2004 | - | 0.25 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2004 | - | 0.19 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2004 | - | 0.1 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2004 | - | 0.3 | - | - | - | - | - | - | - | - | Cincinelli et al., 2009 |
| 2001 | 19.5 | 0.2 | - | 2.26 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 12.2 | 0.49 | - | 2.08 | - | - | - | - | - | - | Dickhut et al. 2005 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2001 | 22.4 | 0.46 | - | 0.8 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 23.1 | 0.52 | - | 0.48 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 12.6 | 0.35 | - | 0.87 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 28.1 | 0.38 | - | 0.29 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 24 | 0.39 | - | 2.41 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 24.7 | 0.16 | - | 0.24 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 15.3 | 0.41 | - | 0.42 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 11.9 | 0.26 | - | 1.18 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | <5 | 0.28 | - | 2.09 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | 21.2 | 0.33 | - | 0.06 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2001 | | 0.37 | - | 0.28 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | <0.05 | - | 0.91 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.39 | - | 0.45 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.32 | - | 0.45 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.24 | - | 2.98 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.34 | - | 0.31 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.19 | - | <0.02 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.1 | - | 0.45 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.2 | - | 0.2 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.3 | - | 0.29 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.47 | - | 0.26 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.39 | - | 0.32 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.35 | - | 0.47 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.18 | - | 0.2 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.31 | - | <0.02 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.24 | - | 0.41 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.25 | - | <0.02 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2002 | | 0.34 | - | 0.43 | - | - | - | - | - | - | Dickhut et al. 2005 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2002 | | 0.32 | - | 0.34 | - | - | - | - | - | - | Dickhut et al. 2005 |
| 2008 | 9.33 | 0.87 | - | 3.89 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2008 | 13.54 | 5.84 | - | 5.11 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2008 | 2.18 | 0.06 | - | 3.93 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2008 | 3.28 | 0.18 | - | 5.84 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2008 | 5.01 | 1.2 | - | 7.1 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2008 | 15.82 | 2.09 | - | 1.47 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 2.35 | 0.31 | - | 0.54 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 30.13 | 0.14 | - | 1.87 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 25.98 | 0.05 | - | 0.11 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 3.31 | 0.04 | - | 0.2 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 34.24 | 0.23 | - | 0.25 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 12.62 | 0.46 | - | 3 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 51.82 | 0.22 | - | 0.19 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 27.31 | 0.16 | - | 0.07 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2009 | 49.71 | 0.1 | - | 0.16 | - | - | - | - | - | - | Galban-Malagon et al., 2013 |
| 2010-2011 | 179 | 5 | 1.5 | 2.7 | 0.8 | 0.2 | 1.5 | 0.4 | 0.9 | 0.3 | Hao et al. 2019 |
| 2011-2012 | 167 | 1.9 | 0.9 | 0.5 | 0.2 | 0.09 | 0.3 | 0.14 | 0.16 | 0.06 | Hao et al. 2019 |
| 2012-2013 | 190 | 2.2 | 1.2 | 1.2 | 0.2 | 0.2 | 0.6 | 0.19 | 0.17 | 0.1 | Hao et al. 2019 |
| 2013-2014 | 222 | 2.5 | 0.9 | 1 | 0.2 | 0.2 | 1 | 0.5 | 0.14 | 0.1 | Hao et al. 2019 |
| 2014-2015 | 167 | 1.1 | 0.3 | 0.2 | 0.15 | 0.07 | 0.6 | 0.12 | 0.05 | 0.07 | Hao et al. 2019 |
| 2015-2017 | 129 | 1 | 0.12 | 0.2 | 0.07 | 0.04 | 0.2 | 0.04 | 0.03 | 0.039 | Hao et al. 2019 |
| 2017-2018 | 148 | 0.8 | 0.1 | 0.13 | 0.1 | 0.04 | 0.17 | 0.04 | 0.05 | 0.3 | Hao et al. 2019 |
| 1994 | - | 2.1 | - | | 0.48[x] | | 0.28[x] | <0.03 | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 1994 | - | 1.6 | - | | 0.41[x] | 0.19[x] | 0.21[x] | <0.03 | <0.01 | <0.03 | Kallenborn et al., 1998 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1994 | - | 2.1 | - | | <0.08 | 0.17[x] | 0.56 | <0.03 | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 1994 | - | 2.3 | - | | 0.52[x] | 0.13[x] | 2.6 | <0.03 | 0.38 | 0.09[x] | Kallenborn et al., 1998 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1994 | - | 1.6 | - | | 0.12[x] | 0.17[x] | <0.2 | <0.03 | 0.05[x] | <0.03 | Kallenborn et al., 1998 |
| 1994 | - | 0.7 | - | | 0.24[x] | 0.06[x] | <0.2 | <0.03 | 0.06[x] | 0.04[x] | Kallenborn et al., 1998 |
| 1994 | - | 2 | - | | 0.12[x] | 0.09[x] | <0.2 | <0.03 | 0.05[x] | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 1.6 | - | | <0.08 | 0.06[x] | <0.2 | <0.03 | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 4.6 | - | | 1.1 | 0.07[x] | 0.39[x] | 0.04[x] | 0.10[x] | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | <0.9 | - | | 0.38[x] | 0.34[x] | <0.2 | 0.9 | 0.57 | 0.73 | Kallenborn et al., 1998 |
| 1995 | - | 4.2 | - | | 0.48[x] | 0.49 | 0.29[x] | <0.03 | <0.01 | 0.05[x] | Kallenborn et al., 1998 |
| 1995 | - | 3.7 | - | | 0.43[x] | 0.27[x] | 0.28[x] | 0.04[x] | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 4.6 | - | | 0.42[x] | 0.21[x] | 0.39[x] | <0.03 | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 5.2 | - | | <0.08 | 0.25[x] | 0.40[x] | <0.03 | <0.01 | 0.05[x] | Kallenborn et al., 1998 |
| 1995 | - | <0.9 | - | | <0.08 | <0.01 | 0.85 | <0.03 | 0.57 | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 8.4 | - | | <0.08 | 0.49 | <0.2 | <0.03 | 0.06[x] | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | <0.93 | - | | <0.08 | 0.14[x] | <0.2 | 0.02[x] | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 3 | - | | 0.18[x] | 0.78 | 0.23[x] | 0.04[x] | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 2.5 | - | | 0.30[x] | 0.13[x] | 0.20[x] | <0.03 | 0.05[x] | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 2.7 | - | | 0.25[x] | 0.14[x] | 0.24[x] | 0.04[x] | 0.06[x] | <0.03 | Kallenborn et al., 1998 |
| 1995 | - | 2.7 | - | | <0.08 | <0.01 | <0.2 | 0.03[x] | <0.01 | <0.03 | Kallenborn et al., 1998 |
| 2007 | 19.9 | 0.25 | - | 0.2 | 0.15 | 0.07[x] | 0.2 | - | 0.04 | 0.01 | Kallenborn et al., 2013 |
| 2007 | 24 | 0.21 | - | <LOQ | <LOQ | 0.07 | 0.42 | - | 0.2 | 0.05 | Kallenborn et al., 2013 |
| 2007 | 23.9 | 0.2 | - | <LOQ | <LOQ | 0.16 | 0.03 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 20.1 | 0.2 | - | <LOQ | <LOQ | <LOQ | 0.09 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 21.6 | 0.27 | - | <LOQ | 0.05 | <LOQ | 0.17 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 17.4 | 0.35 | - | 0.1 | 0.03 | <LOQ | 0.09 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 20 | 0.22 | - | <LOQ | <LOQ | <LOQ | 0.05 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 25.5 | 0.3 | - | <LOQ | <LOQ | <LOQ | 0.04 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 26.1 | 0.3 | - | 0.1 | 0.03 | <LOQ | 0.05 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 25.2 | 0.2 | - | <LOQ | 0.03 | <LOQ | 0.03 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 21.2 | 0.31 | - | 0.09 | 0.03 | <LOQ | 0.04 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 23.6 | 0.19 | - | <LOQ | 0.04 | <LOQ | 0.13 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 18.9 | 0.34 | - | 0.12 | 0.04 | <LOQ | 0.1 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 19 | 0.27 | - | 0.09 | 0.03 | 0.03 | 0.1 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 23.7 | 0.25 | - | 0.1 | 0.09 | 0.03 | 0.09 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 21.7 | 0.28 | - | 0.15 | 0.03 | 0.03 | 0.08 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 20.4 | 0.23 | - | 0.1 | 0.03 | 0.03 | 0.1 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 24.2 | 0.24 | - | 0.11 | 0.12 | 0.03 | 0.18 | - | 0.04 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 25.1 | 0.2 | - | <LOQ | 0.1 | 0.05 | 0.55 | - | 0.07 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 24.4 | 0.2 | - | <LOQ | 0.11 | 0.04 | 0.1 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 29.2 | 0.22 | - | <LOQ | 0.16 | 0.03 | 0.16 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 24.1 | 0.23 | - | 0.09 | 0.04 | 0.04 | 0.11 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 28.6 | 0.5 | - | 0.23 | 0.05 | 0.03 | 0.08 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 26.5 | 0.18 | - | <LOQ | 0.05 | 0.06 | 0.07 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 24.6 | 0.3 | - | 0.12 | 0.03 | <LOQ | 0.07 | - | 0.07 | 0.04 | Kallenborn et al., 2013 |
| 2007 | <LOQ | 0.76 | - | 0.27 | 0.05 | 0.07 | 0.24 | - | 0.06 | 0.03 | Kallenborn et al., 2013 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 24.4 | 0.27 | - | 0.09 | 0.04 | 0.09 | 0.1 | - | 0.02 | 0.02 | Kallenborn et al., 2013 |
| 2007 | 23.9 | 0.34 | - | 0.14 | 0.03 | 0.03 | 0.09 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 27.6 | 0.25 | - | <LOQ | 0.03 | <LOQ | 0.04 | - | 0.02 | 0.02 | Kallenborn et al., 2013 |
| 2007 | 27.7 | 0.2 | - | <LOQ | 0.03 | <LOQ | 0.14 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 30.2 | 0.22 | - | <LOQ | 0.03 | <LOQ | 0.14 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 30.4 | 0.29 | - | <LOQ | <LOQ | <LOQ | 0.12 | - | 0.03 | <LOQ | Kallenborn et al., 2013 |
| 2007 | 29.4 | 0.34 | - | <LOQ | <LOQ | <LOQ | 0.03 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 22 | 0.36 | - | 0.1 | <LOQ | <LOQ | 0.06 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 25.1 | 0.29 | - | <LOQ | <LOQ | <LOQ | 0.04 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 12.3 | 0.26 | - | <LOQ | <LOQ | <LOQ | 0.04 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 16.7 | 0.24 | - | 0.1 | <LOQ | <LOQ | 0.04 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 9.87 | 0.3 | - | 0.13 | 0.09 | <LOQ | 0.1 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 14.6 | 0.21 | - | <LOQ | <LOQ | 0.07 | 0.03 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 18.7 | 0.24 | - | 0.1 | <LOQ | <LOQ | 0.03 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2007 | 16.5 | 0.17 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 15.6 | 0.18 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 13.2 | 0.18 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 16.5 | 0.17 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2008 | 11.6 | 0.18 | - | <LOQ | 0.04 | <LOQ | 0.03 | - | 0.02 | <LOQ | Kallenborn et al., 2013 |
| 2008 | 17 | 0.17 | - | <LOQ | <LOQ | 0.03 | 0.03 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 14.8 | 0.15 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2008 | 20.2 | 0.16 | - | <LOQ | <LOQ | <LOQ | <LOQ | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 13.8 | 0.15 | - | <LOQ | <LOQ | <LOQ | <LOQ | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 16 | 0.16 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 16.4 | 0.2 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2008 | 19.1 | 0.18 | - | <LOQ | <LOQ | <LOQ | 0.02 | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
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| 2009 | 22.1 | 0.23 | - | 0.09 | <LOQ | <LOQ | <LOQ | - | <LOQ | <LOQ | Kallenborn et al., 2013 |
| 2009 | 22.8 | 0.38 | - | 0.45 | 0.08 | <LOQ | 0.22 | - | 0.07 | <LOQ | Kallenborn et al., 2013 |
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| 1988 | | | - | 28 | - | - | - | - | - | - | Larson et al., 1992 |
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| 1988 | | | - | 21 | - | - | - | - | - | - | Larson et al., 1992 |
| 1988 | | | - | 27 | - | - | - | - | - | - | Larson et al., 1992 |
| 1988 | | | - | 19 | - | - | - | - | - | - | Larson et al., 1992 |
| 1988 | | | - | 17 | - | - | - | - | - | - | Larson et al., 1992 |
| 1988 | | | - | 65 | - | - | - | - | - | - | Larson et al., 1992 |
| 1988 | | | - | 118 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 47 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 108 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 50 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 96 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 13 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 81 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 33 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 18 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 38 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | ND | - | - | - | - | - | - | Larson et al., 1992 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1989 | | | - | 8 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 7 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 27 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 16 | - | - | - | - | - | - | Larson et al., 1992 |
| 1989 | | | - | 58 | - | - | - | - | - | - | Larson et al., 1992 |

Continue

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 1990 | | | - | 72 | - | - | - | - | - | - | Larson et al., 1992 |
| 1995 | 3.3 | 4.7 | - | 17.6 | 19.4 | - | 53.8 | - | 29.4 | - | Montone et al., 2005 |
| 1995 | <0.6 | 14.1 | - | 18.4 | 9.7 | - | 8.9 | - | 6.8 | - | Montone et al., 2005 |
| 1995 | 9.2 | 14.2 | - | 10.1 | 3.6 | - | 7.1 | - | 6.1 | - | Montone et al., 2005 |
| 1995 | 8 | 14.2 | - | 13.8 | 5.6 | - | 9.8 | - | 4.4 | - | Montone et al., 2005 |
| 1995 | 7.3 | 6 | - | 13.4 | 2.4 | - | 4.7 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 8.8 | 5.9 | - | 12.4 | <2.7 | - | 5.3 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 10.9 | 10.7 | - | 10.3 | <2.7 | - | 2 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 4 | 3.1 | - | 5.6 | <2.7 | - | 2.8 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | <0.6 | 2.4 | - | <2.7 | <2.7 | - | 6.1 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 11.5 | 7.3 | - | 5.1 | <2.7 | - | 2.2 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 17.4 | 5.3 | - | 6.3 | <2.7 | - | <2.0 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 24.6 | 3.3 | - | 3 | <2.7 | - | 5.2 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 25.3 | 3.5 | - | 4.6 | <2.7 | - | <2.0 | - | <2.7 | - | Montone et al., 2005 |
| 1995 | 21.9 | 4.5 | - | <2.7 | <2.7 | - | 2.2 | - | <2.7 | - | Montone et al., 2005 |
| 1997 | - | 0.93 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 0.92 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 0.49 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 0.81 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 0.87 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 0.94 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1997 | - | 1.4 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 1.3 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 1.3 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 1.1 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 1997 | - | 1.5 | - | - | - | - | - | - | - | - | Jantunen et al., 2004 |
| 2011 | 23.4 | | - | BDL | 0.04 | - | BDL | - | BDL | - | Pozo et al., 2017 |
| 2011 | 18.4 | | - | BDL | 0.07 | - | 0.1 | - | BDL | - | Pozo et al., 2017 |
| 2011 | 30.6 | 0.05 | - | BDL | BDL | - | BDL | - | BDL | - | Pozo et al., 2017 |
| 2011 | 17.1 | - | - | BDL | BDL | - | BDL | - | BDL | - | Pozo et al., 2017 |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | 0.8 | _ | - | BDL | BDL | - | BDL | - | BDL | - | Pozo et al., 2017 |
| 2011 | 47 | _ | - | BDL | 0.03 | - | BDL | - | BDL | - | Pozo et al., 2017 |
| 2013 | 0.17 | 1.4 | 2 | 1.6 | ND | ND | 0.15 | ND | ND | ND | Wu et al., 2020 |
| 2013 | 0.45 | 4 | ND | 6.1 | ND | ND | ND | 0.028 | ND | ND | Wu et al., 2020 |
| 2013 | 6.4 | ND[a] | ND | 1.6 | ND | ND | 0.62 | ND | ND | ND | Wu et al., 2020 |
| 2013 | 3.1 | ND | ND | ND | ND | ND | 0.37 | 0.16 | ND | ND | Wu et al., 2020 |
| 2013 | 0.79 | 4.7 | ND | 6.1 | 0.89 | ND | ND | 0.062 | 0.069 | ND | Wu et al., 2020 |
| 2013 | 4.4 | ND | ND | ND | ND | ND | 0.37 | 0.17 | ND | ND | Wu et al., 2020 |
| 2013 | 0.13 | ND | ND | ND | ND | ND | ND | 0.041 | ND | ND | Wu et al., 2020 |
| 2014 | 0.21 | ND | ND | ND | ND | ND | ND | 0.28 | ND | ND | Wu et al., 2020 |
| 2014 | 4.1 | ND | ND | ND | ND | ND | ND | 0.41 | ND | 0.59 | Wu et al., 2020 |
| 2014 | 3.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |
| 2014 | 7.1 | ND | ND | ND | ND | ND | ND | 0.27 | ND | ND | Wu et al., 2020 |
| 2014 | 1.2 | ND | ND | ND | ND | ND | 0.77 | ND | ND | ND | Wu et al., 2020 |
| 2014 | 2.9 | ND | ND | ND | ND | ND | 1.2 | ND | ND | ND | Wu et al., 2020 |
| 2014 | 2.4 | ND | ND | ND | ND | ND | 0.88 | ND | ND | ND | Wu et al., 2020 |
| 2014 | 1.4 | ND | ND | ND | ND | 3.2 | 1.7 | 0.63 | ND | ND | Wu et al., 2020 |
| 2014 | 1.2 | ND | ND | ND | ND | ND | 1.5 | ND | ND | ND | Wu et al., 2020 |
| 2014 | 0.42 | ND | ND | ND | ND | ND | ND | 0.036 | ND | ND | Wu et al., 2020 |
| 2014 | 2 | ND | ND | ND | ND | ND | 0.27 | ND | ND | ND | Wu et al., 2020 |
| 2014 | 0.46 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |
| 2014 | 0.081 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |
| 2014 | 4.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |
| 2014 | 6.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | 10 | ND | ND | ND | ND | ND | 1.3 | 0.41 | 0.21 | ND | Wu et al., 2020 |
| 2014 | 4 | ND | ND | ND | ND | ND | 0.28 | 0.1 | ND | ND | Wu et al., 2020 |
| 2014 | 0.22 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |
| 2014 | 0.12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |
| 2014 | 0.13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |
| 2014 | 4.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | Wu et al., 2020 |

Table S.2. Reported atmospheric levels for the 7 polychlorinated byphenyls (PCBs) congeners reviewed. ND: Not detected, NR: Not reported, BDL: Below detection limit, LOQ: Limit of quantification

| Year | PCB 28 | PCB 52 | PCB 101 | PCB 118 | PCB 138 | PCB 153 | PCB 180 | Reference |
|---|---|---|---|---|---|---|---|---|
| 2009 | 0.576 | 1.775 | - | 0.082 | 0.281 | 1.359 | 0.187 | Cabrerizo et al., 2013 |
| 2009 | 0.29 | 1.325 | - | 0.048 | 0.227 | 1.38 | 0.196 | Cabrerizo et al., 2013 |
| 2009 | 0.216 | 0.863 | - | 0.02 | 0.126 | 1.119 | 0.153 | Cabrerizo et al., 2013 |
| 2009 | 0.238 | 0.672 | - | 0.048 | 0.174 | 1.175 | 0.185 | Cabrerizo et al., 2013 |
| 2009 | 0.633 | 1.977 | - | 0.124 | 0.609 | 1.27 | 0.215 | Cabrerizo et al., 2013 |
| 2009 | 0.315 | 0.494 | - | 0.108 | 0.454 | 1.139 | 0.2 | Cabrerizo et al., 2013 |
| 2009 | 0.781 | 2.133 | - | 0.405 | 0.881 | 1.211 | 0.188 | Cabrerizo et al., 2013 |
| 2009 | 0.281 | 1.29 | - | 0.064 | 0.34 | 0.819 | 0.13 | Cabrerizo et al., 2013 |
| 2009 | 0.6 | 1.296 | - | 0.339 | 0.581 | 1.107 | 0.221 | Cabrerizo et al., 2013 |
| 2009 | 0.133 | 0.88 | | 0.022 | 0.144 | 0.854 | 0.144 | Cabrerizo et al., 2013 |
| 2009 | 0.186 | 0.505 | - | 0.034 | 0.212 | 0.729 | 0.143 | Cabrerizo et al., 2013 |
| 2009 | 0.224 | 0.534 | - | 0.02 | 0.159 | 0.718 | 0.108 | Cabrerizo et al., 2013 |
| 2009 | 0.259 | 0.691 | - | 0.058 | 0.359 | 0.783 | 0.142 | Cabrerizo et al., 2013 |
| 2009 | 0.144 | | - | 0.035 | 0.231 | 0.565 | 0.108 | Cabrerizo et al., 2013 |
| 2009 | 0.247 | 3.86 | - | 0.036 | 0.262 | 0.628 | 0.129 | Cabrerizo et al., 2013 |
| 2005 | 1.41 | 4.84 | - | 0.68 | 0.88 | 1.02 | 0.51 | Galbán-Malagón et al., 2013 |
| 2005 | 1.07 | 5.01 | - | 1.97 | 1.91 | 2.38 | 0.35 | Galbán-Malagón et al., 2013 |
| 2005 | 2.62 | 3.73 | - | 0.51 | 2.59 | 2.8 | 0.18 | Galbán-Malagón et al., 2013 |
| 2005 | 2.02 | 1.53 | - | 0.62 | 0.94 | 1.06 | 0.13 | Galbán-Malagón et al., 2013 |
| 2005 | 0.88 | | - | 0.57 | 0.59 | 0.71 | 0.52 | Galbán-Malagón et al., 2013 |
| 2005 | 0.53 | 2.38 | - | 0.25 | 0.42 | 0.49 | 0.2 | Galbán-Malagón et al., 2013 |
| 2005 | 2.59 | 5.1 | - | 1.39 | 1.92 | 2.28 | 0.3 | Galbán-Malagón et al., 2013 |
| 2005 | 0.6 | 5.35 | - | 0.38 | 0.65 | 0.69 | 0.34 | Galbán-Malagón et al., 2013 |
| 2005 | 1.56 | 6.1 | - | 0.51 | 1.01 | 0.93 | 0.17 | Galbán-Malagón et al., 2013 |
| 2005 | 2.71 | 0.56 | - | 0.79 | 1.1 | 1.08 | NR | Galbán-Malagón et al., 2013 |
| 2005 | 1.82 | 0.09 | - | 0.58 | 0.56 | 0.56 | NR | Galbán-Malagón et al., 2013 |
| 2008 | 3.89 | 0.09 | - | 2.27 | 4.39 | 2.87 | 1.9 | Galbán-Malagón et al., 2013 |
| 2008 | 5.11 | 1.77 | - | 4.07 | 2.75 | 2.68 | 0.03 | Galbán-Malagón et al., 2013 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2008 | 0.39 | 4.56 | - | 0.59 | 0.17 | 0.22 | 0.12 | Galbán-Malagón et al., 2013 |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2008 | 0.58 | 1.29 | - | 0.26 | 0.37 | 0.48 | 0.75 | Galbán-Malagón et al., 2013 |
| 2008 | 12.96 | 0.78 | - | 1.8 | 1.94 | 1.75 | 1.41 | Galbán-Malagón et al., 2013 |
| 2008 | 2.93 | 2.92 | - | 0.89 | 2.17 | 11.21 | 0.39 | Galbán-Malagón et al., 2013 |
| 2009 | 1.05 | 0.29 | - | 0.43 | 1.22 | 1.55 | 0.13 | Galbán-Malagón et al., 2013 |
| 2009 | 1.97 | 0.1 | - | 0.14 | 0.53 | 0.71 | 0.89 | Galbán-Malagón et al., 2013 |
| 2009 | 5.1 | 1.15 | - | 1.19 | 2.01 | 2.57 | 0.26 | Galbán-Malagón et al., 2013 |
| 2009 | 2 | 0.36 | - | 0.33 | 0.74 | 0.91 | 0.18 | Galbán-Malagón et al., 2013 |
| 2009 | 1.18 | 0.23 | - | 0.38 | 0.21 | 0.55 | 0.23 | Galbán-Malagón et al., 2013 |
| 2009 | 1.5 | 0.43 | - | 1 | 0.72 | 0.71 | 0.27 | Galbán-Malagón et al., 2013 |
| 2009 | 3.14 | 1.3 | - | 0.33 | 0.7 | 0.75 | 0.32 | Galbán-Malagón et al., 2013 |
| 2009 | 1.58 | 0.6 | - | 0.15 | 0.41 | 0.87 | 0.17 | Galbán-Malagón et al., 2013 |
| 2009 | 0.89 | NR | - | 0.17 | 0.23 | 0.45 | 0.04 | Galbán-Malagón et al., 2013 |
| 2009 | 0.16 | NR | - | 0.02 | 0.05 | 0.12 | 0.01 | Galbán-Malagón et al., 2013 |
| 2009 | 0.21 | NR | - | 0.02 | 0.01 | 0.07 | 0.02 | Galbán-Malagón et al., 2013 |
| 2009 | 0.2 | NR | - | 0.02 | 0.02 | 0.08 | NR | Galbán-Malagón et al., 2013 |
| 2003-2004 | - | - | - | *2* | | - | - | Gambaro et al., 2005 |
| 2010-2011 | 4.7 | 1.1 | 0.3 | 0.14 | 0.3 | 0.5 | 0.1 | Hao et al. 2019 |
| 2011-2012 | 2.3 | 0.5 | 0.3 | 0.17 | 0.2 | 0.3 | 0.07 | Hao et al. 2019 |
| 2012-2013 | 4.4 | 0.69 | 0.3 | 0.2 | 0.16 | 0.21 | 0.05 | Hao et al. 2019 |
| 2013-2014 | 3.3 | 0.4 | 0.3 | 0.13 | 0.12 | 0.14 | 0.03 | Hao et al. 2019 |
| 2014-2015 | 1.3 | 0.3 | 0.3 | 0.14 | 0.2 | 0.2 | 0.05 | Hao et al. 2019 |
| 2015-2017 | 0.7 | 0.15 | 0.07 | 0.03 | 0.04 | 0.06 | 0.02 | Hao et al. 2019 |
| 2017-2018 | 0.5 | 0.11 | 0.06 | 0.02 | 0.03 | 0.05 | 0.01 | Hao et al. 2019 |
| 1994 | 3.9 | 1.1 | 0.53[×] | 0.53 | 0.51[×] | 0.45[×] | 0.17[×] | Kallenborn et al., 1998 |
| 1994 | 0.84[×] | 0.31[×] | 0.26[×] | 0.32[×] | 0.24[×] | 0.30[×] | 0.12[×] | Kallenborn et al., 1998 |
| 1994 | 1.0[×] | 0.44[×] | 0.27[×] | 0.39[×] | 0.34[×] | 0.48 | 0.18[×] | Kallenborn et al., 1998 |
| 1994 | 1.8[×] | 0.98[×] | 0.59[×] | 1.1 | 1.4 | 2.7 | 1.11 | Kallenborn et al., 1998 |
| 1994 | 2.8[×] | 0.93[×] | 0.29[×] | 0.23[×] | 0.22[×] | <0.2 | 0.09[×] | Kallenborn et al., 1998 |
| 1994 | <0.8 | 0.12[×] | 0.06[×] | 0.07[×] | 0.06[×] | <0.2 | 0.03[×] | Kallenborn et al., 1998 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1995 | 1.2[x] | 0.46[x] | 0.13[x] | 0.16[x] | <0.1 | <0.2 | 0.09[x] | Kallenborn et al., 1998 |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1995 | 16 | 9.5 | 3.9 | 0.6 | 0.57 | 0.94 | 0.13[x] | Kallenborn et al., 1998 |
| 1995 | 25 | 13 | 4.5 | 0.95 | 0.83 | 1.2 | 0.2 | Kallenborn et al., 1998 |
| 1995 | 15 | 12 | 5 | 0.79 | 0.63 | 1.1 | 0.06[x] | Kallenborn et al., 1998 |
| 1995 | 22 | 12 | 4.5 | 0.85 | 0.77 | 1.3 | 0.22 | Kallenborn et al., 1998 |
| 1995 | 16 | 8.8 | 3.4 | 0.68 | 0.71 | 0.98 | 0.18[x] | Kallenborn et al., 1998 |
| 1995 | 21 | 13 | 4.8 | 0.79 | 0.79 | 1.4 | 0.22 | Kallenborn et al., 1998 |
| 1995 | 24 | 15 | 5.7 | 0.95 | 1.1 | 1.6 | 0.29 | Kallenborn et al., 1998 |
| 1995 | 9.4 | 6 | 2.3 | 0.33[x] | 0.27 | 0.53 | 0.09[x] | Kallenborn et al., 1998 |
| 1995 | <0.8 | <0.4 | 3.6 | 0.61 | 1.1 | 1.1 | 0.24 | Kallenborn et al., 1998 |
| 1995 | 4.7 | 1.1 | 0.26 | 0.12[x] | <0.1 | <0.2 | 0.02[x] | Kallenborn et al., 1998 |
| 1995 | 16 | 9.5 | 3.9 | 0.6 | 0.57 | 0.94 | 0.13[x] | Kallenborn et al., 1998 |
| 1995 | 13 | 7.5 | 2.9 | 0.49 | 0.45[x] | 0.73 | 0.11[x] | Kallenborn et al., 1998 |
| 1995 | 14 | 8.4 | 3.4 | 0.54 | 0.52[x] | 0.84 | 3.4 | Kallenborn et al., 1998 |
| 1995 | 7.4 | 4.6 | 1.7 | 0.27[x] | 0.28[x] | 0.43[x] | 0.06[x] | Kallenborn et al., 1998 |
| 2008 | 0.25 | - | <LOQ | - | - | - | - | Kallenborn et al., 2013 |
| 2008 | 0.16 | - | <LOQ | - | - | - | - | Kallenborn et al., 2013 |
| 2009 | 0.13 | - | 0.1 | - | - | - | - | Kallenborn et al., 2013 |
| 2009 | 0.21 | - | 0.07 | - | - | - | - | Kallenborn et al., 2013 |
| 2010 | 0.18 | - | 0.07 | - | - | - | - | Kallenborn et al., 2013 |
| 2010 | 0.45 | - | 0.24 | - | - | - | - | Kallenborn et al., 2013 |
| 2010 | 0.15 | - | 0.09 | - | - | - | - | Kallenborn et al., 2013 |
| 1988 | - | - | 4 | - | 2 | 4 | - | Larson et al., 1999 |
| 1988 | - | - | ND | - | 1 | 1 | - | Larson et al., 1999 |
| 1988 | - | | 1 | | 1 | 1 | | Larson et al., 1999 |
| 1988 | - | - | 14 | - | 14 | 10 | - | Larson et al., 1999 |
| 1988 | - | - | ND | - | 1 | 0.5 | - | Larson et al., 1999 |
| 1988 | - | - | 1 | - | 0.3 | 0.3 | - | Larson et al., 1999 |
| 1988 | - | - | 4 | - | 1 | 1 | - | Larson et al., 1999 |
| 1988 | - | - | 2 | - | 1 | 1 | - | Larson et al., 1999 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1988 | - | - | ND | - | 1 | 1 | - | Larson et al., 1999 |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1988 | | - | 1 | - | 0.4 | 0.3 | - | Larson et al., 1999 |
| 1988 | - | - | ND | - | 13 | 10 | - | Larson et al., 1999 |
| 1988 | - | - | 444 | - | 1810 | 1280 | - | Larson et al., 1999 |
| 1988 | - | - | 2 | - | 9 | 1 | - | Larson et al., 1999 |
| 1989 | - | - | 2 | - | 2 | 1 | - | Larson et al., 1999 |
| 1989 | - | - | 3 | - | 1 | 1 | - | Larson et al., 1999 |
| 1989 | - | - | ND | - | ND | ND | - | Larson et al., 1999 |
| 1989 | - | | 7 | | 5 | 15 | | Larson et al., 1999 |
| 1989 | - | - | 1 | - | 1 | 1 | - | Larson et al., 1999 |
| 1989 | - | - | 7 | - | 2 | 2 | - | Larson et al., 1999 |
| 1989 | - | - | ND | - | 1 | 1 | - | Larson et al., 1999 |
| 1989 | - | - | 4 | - | 1 | 1 | - | Larson et al., 1999 |
| 1989 | - | - | 1 | - | ND | 0 | - | Larson et al., 1999 |
| 1989 | - | - | ND | - | ND | ND | - | Larson et al., 1999 |
| 1989 | | - | 2 | - | 1 | 0 | - | Larson et al., 1999 |
| 1989 | - | - | ND | - | 1 | 1 | - | Larson et al., 1999 |
| 1989 | - | - | 3 | - | 2 | 2 | - | Larson et al., 1999 |
| 1989 | - | - | 0.5 | - | 0.2 | 0.3 | - | Larson et al., 1999 |
| 1989 | - | - | 1 | - | 0.3 | 0.4 | - | Larson et al., 1999 |
| 1990 | - | - | 1 | - | 1 | 1 | - | Larson et al., 1999 |
| 2009-2010 | 3.46 | 0.67 | 0.1 | 0.197 | 0.18 | 0.26 | 0.039 | Li et al. 2012 |
| 2009-2010 | 5.53 | 0.62 | 0.05 | 0.07 | 0.05 | 0.07 | 0.009 | Li et al. 2012 |
| 2009-2010 | 1.7 | 0.24 | 0.16 | 0.042 | 0.03 | 0.04 | 0.006 | Li et al. 2012 |
| 2009-2010 | 5.1 | 0.78 | 0.05 | 0.148 | 0.11 | 0.17 | 0.029 | Li et al. 2012 |
| 2009-2010 | 1.17 | 0.2 | 0.19 | 0.064 | 0.06 | 0.1 | 0.019 | Li et al. 2012 |
| 2009-2010 | 0.57 | 0.068 | 0.086 | 0.034 | 0.032 | 0.028 | 0.01 | Li et al. 2012b |
| 2009-2010 | 1.08 | 0.056 | 0.14 | 0.026 | 0.048 | 0.04 | 0.008 | Li et al. 2012b |
| 2009-2010 | 1.1 | 0.13 | 0.32 | 0.024 | 0.03 | 0.032 | 0.01 | Li et al. 2012b |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2009-2010 | 0.28 | 0.21 | 0.084 | 0.036 | 0.036 | 0.04 | 0.012 | Li et al. 2012b |
| 1993 | - | 8 | 6.8 | 5.9 | 3.8 | 7.3 | <0.64 | Montone et al., 2001 |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1993 | - | 4.7 | <4.00 | 2.4 | <2.30 | 3.7 | <0.64 | Montone et al., 2001 |
| 1993 | - | 7.8 | <4.00 | 3.6 | <2.30 | 4.7 | <0.64 | Montone et al., 2001 |
| 1994 | - | <4.57 | <4.00 | 6.1 | 3.4 | 4.8 | <0.64 | Montone et al., 2001 |
| 1994 | - | <4.57 | <4.00 | <2.40 | <2.30 | <3.56 | <0.64 | Montone et al., 2001 |
| 1994 | - | <4.57 | <4.00 | <2.40 | <2.30 | <3.56 | <0.64 | Montone et al., 2001 |
| 1994 | - | <4.57 | <4.00 | <2.40 | <2.30 | <3.56 | <0.64 | Montone et al., 2001 |
| 1994 | - | <4.57 | <4.00 | <2.40 | <2.30 | <3.56 | <0.64 | Montone et al., 2001 |
| 1995 | - | 7.3 | 5.2 | 4.9 | 2.7 | 3.8 | <0.6 | Montone et al., 2003 |
| 1995 | - | 8.7 | 7.2 | 17 | 10.4 | 18.5 | <0.6 | Montone et al., 2003 |
| 1995 | - | 2.3 | 4 | 4.4 | 2.5 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | 19.1 | 12 | 8.5 | 5.2 | 4.1 | <0.6 | Montone et al., 2003 |
| 1996 | - | 33.2 | 10.7 | 8.7 | 4.3 | 6.4 | <0.6 | Montone et al., 2003 |
| 1996 | - | 6.6 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | -4.6 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | -4.6 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | 10.5 | 5.4 | 4.5 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | 9 | 9.5 | 11.5 | 4.6 | 8.2 | <0.6 | Montone et al., 2003 |
| 1996 | - | 17 | 8.2 | 6.7 | -2.3 | 4.5 | <0.6 | Montone et al., 2003 |
| 1996 | - | -4.6 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | -4.6 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | -4.6 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | 6.8 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | 5.7 | <4 | <2.4 | -2.3 | <3.6 | <0.6 | Montone et al., 2003 |
| 1996 | - | 8.6 | 150.8 | 207.8 | | <3.6 | <0.6 | Montone et al., 2003 |
| 1995 | 14.9 | 6.9 | 4.6 | <2.4 | 3 | <3.6 | <0.6 | Montone et al., 2005 |
| 1995 | 14.7 | 9.6 | 9.3 | 6 | 4 | 7.1 | <0.6 | Montone et al., 2005 |
| 1995 | 23.8 | 11.4 | 7 | 2.8 | 2.3 | 4.1 | <0.6 | Montone et al., 2005 |
| 1995 | 9.3 | 9.3 | 6 | 2.9 | 2.6 | 3.9 | <0.6 | Montone et al., 2005 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2011 | BDL | 0.1 | 0.03 | 0.07 | 0.11 | 0.04 | 0.06 | Pozo et al. 2017 |
| 2011 | 0.03 | 0.08 | 0.03 | BDL | 0.07 | 0.04 | BDL | Pozo et al. 2017 |

Continue

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2011 | BDL | 0.25 | 0.1 | BDL | 0.06 | BDL | BDL | Pozo et al. 2017 |
| 2011 | BDL | 0.09 | 0.09 | 0.22 | 0.27 | 0.19 | 0.27 | Pozo et al. 2017 |
| 2011 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | Pozo et al. 2017 |
| 2011 | BDL | BDL | 0.04 | 0.05 | BDL | 0.02 | BDL | Pozo et al. 2017 |
| 2011 | 9.8 | 0.7 | 0.17 | 0.08 | 0.07 | 0.14 | 0.02 | Wang et al., 2017 |
| 2012 | 2.76 | 0.33 | 0.12 | 0.03 | 0.03 | 0.07 | 0.01 | Wang et al., 2017 |
| 2013 | 2.2 | 0.42 | 0.35 | 0.041 | 0.04 | 0.09 | 0.009 | Wang et al., 2017 |
| 2014 | 1.42 | 0.18 | 0.13 | 0.025 | 0.03 | 0.05 | 0.007 | Wang et al., 2017 |
| 2013 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2013 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2013 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2013 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2013 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2013 | ND | ND | 0.088 | ND | ND | ND | ND | Wu et al. 2020 |
| 2013 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | 1.4 | 2.4 | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | 1.6 | 1 | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | 0.15 | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | 0.14 | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |

Continue

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2014 | ND | ND | 0.12 | ND | ND | 0.094 | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | ND | ND | Wu et al. 2020 |
| 2014 | ND | ND | 0.12 | 0.34 | 0.2 | 0.3 | 0.27 | Wu et al. 2020 |
| 2014 | ND | ND | ND | 0.14 | ND | 0.14 | 0.083 | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | 0.1 | ND | Wu et al. 2020 |
| 2014 | ND | ND | ND | ND | ND | 0.097 | ND | Wu et al. 2020 |

Table S.3. Physical-chemical properties of POPs reported in the Antarctic atmosphere. Data shown are the molecular weight (MW), Henry's law constant (H), octanol-water partition coefficient (log $K_{OW}$), octanol-air partition coefficient (log $K_{OA}$) and estimated atmospheric decrementing times ($T_D$) and half-lives reported by other studies.

| **Compound** | **MW (g mol$^{-1}$)** | **H (Pa m$^3$mol$^{-1}$ at 25ºC)** | **log $K_{OW}$** | **log $K_{OA}$** | **$T_D$ (Years)** | **Half-life (Years)** |
|---|---|---|---|---|---|---|
| HCB | 285 | 53 [a] | 5.7 [a] | 7.2 [a] | 12.3 | 0.4 - 4.3[k] |
| α-hch | 291 | 0.74 [b] | 3.8 [d] | 7.5 [b] | 14.3 | 0.06[k] |
| γ-hch | 291 | 0.31 [b] | 3.6 [e] | 3.8 [b] | 10.1 | 0.006[m] - 0.019[k] |
| 2,4 DDE | 319 | 4.2 | 5.43[g] | 9.7 | 17.6 | 0.002[n] |
| 4,4-DDE | 319 | 4.2 [a] | 6.96 [d] | 9.7 [a] | 13.47 | 0.002[n] |
| 4,4 DDD | 321 | 0.5 [a] | 6.22 [d] | 10a | 12.76 | 0.002-0.02[m] |
| 2,4 DDT | 354 | 1.1 | 8.3 [h] | 9.6 [j] | 14.4 | 0.002-0.02[m] |
| 4,4 DDT | 354 | 1.1 [a] | 6.39[i] | 9.8 [a] | 17.2 | 0.002-0.02[m] |
| PCB 28 | 257 | 37 [c] | 5.7 [f] | 7.9 [c] | 3.9 | 0.038 - 0.08[k]; 0.008[l] |
| PCB 52 | 292 | 31 [c] | 5.9 [f] | 8.2 [c] | 3.7 | 0.06-0.16[k]; 0.17[l] |
| PCB 101 | 326 | 43 [c] | 6.3 [f] | 8.2 [c] | 4.7 | 0.16-0.32[k]; 0.34[l] |
| PCB 118 | 326 | 37 [c] | 6.7 [f] | 9.4 [c] | 3.6 | 0.16-0.32[k]; 0.34[l] |
| PCB 138 | 361 | 45 [c] | 7 [f] | 9.7 [c] | 6.5 | 0.07-0.2[k]; o.68[l] |
| PCB 153 | 361 | 50 [c] | 6.9 [f] | 10.4 [c] | 7.6 | 0.07-0.2[k]; 0.68[l] |
| PCB 180 | 395 | 37 [c] | 7.2 [f] | 10.2 [c] | 4.6 | 1.36[k] |

**References:** [a]Shen and Wania (2005); [b]Xiao et al. (2004); [c]Bamford et al. (2002); [d]Hansch et al. (1995); [e]Sangster (1993); [f]Li et al. (2003); [g]Finzio (1993); [h]Chen et al. (1993); [i]Xiao et al. (2004); [j]Shoeib & Harner (2002); [k]Atkinson (1987); [l]Sinkonen & Parsivita (2000); [m]Howard (1991); [n]Kelly et al. (1994)

Table S.4. Results of U-Mann Whitney test performed to evaluate differences in POPs levels between East and West Antarctica.

| Compound | p-value |
|---|---|
| α-HCH | 2.20E-14 |
| γ-HCH | 0.4 |
| HCB | 2.80E-06 |
| 2,4´-DDT | 0.01085 |
| 4,4’-DDT | 3.06E-06 |
| PCB-28 | 0.00003 |
| PCB-52 | 0.00007 |
| PCB-101 | 0.5 |
| PCB-118 | 0.06 |
| PCB-138 | 0.01 |
| PCB-153 | 0.8 |
| PCB-180 | 0.8 |

References

ımford, H. A., Poster, D. L., Huie, R. E., Baker, J. E.: (2002). Using extra thermodynamic relationships to model the temperature dependence of Henry's law constants of 209 PCB congeners. Environ. Sci Environ. Sci. Technol.,. Technol. 36, 4395–4402. doi: 10.1021/es020599y, 2002..

ıen, F., Holten-Andersen, J., & Tyle, H.: (1993). New developments of the UNIFAC model for environmental application. Chemosphere, 26(7), 1325-1354.

nizio, A., Guardo, A. D., & Vigh, M. (1994). Improved RP-HPLC determination of Kow for some chloroaromatic chemicals using molecular connectivity indices. *SAR and QSAR in Environmental Research*, *2*(4), 249-260.

ınsch, C., Leo, A., Hoekman, D. (1995). Exploring QSAR: Hydrophobic, electronic, and steric constants. ACS Professional Reference Book. ACS, Washington. 348 pp.

, N., Wania, F., Lei, Y.D., Daly, G.L. (2003). A comprehensive and critical compilation, evaluation, and selection of physical–chemical property data for selected polychlorinated biphenyls. J. Phys. Chem. Ref. Data 32, 1545-1590.

ıngster, J. (1993). LOGKOW – a Databank of Evaluated Octanol-Water Partition Coefficients, Sangster Research Laboratories, Montreal.

ıoeib, M., & Harner, T. (2002). Using measured octanol-air partition coefficients to explain environmental partitioning of organochlorine pesticides. *Environmental Toxicology and Chemistry: An International Journal*, *21*(5), 984-990.

ıen, L., Wania, F. (2005). Compilation, evaluation, and selection of physical-chemical property data for organochlorine pesticides. J. Chem. Eng. Data 50, 742–768.

ıao, H., Li, N., Wania, F. (2004). Compilation, evaluation, and selection of physical-chemical property data for α-, β-, and γ-hexachlorocyclohexane. J. Chem. Eng. Data 49, 173–185.