Ozone Layer Protection - Science

Class II Ozone-depleting Substances

Chemical Name	Lifetime, in years	ODP2 (WMO 2011)	ODP1 (Montreal Protocol)	GWP (AR5)	CAS Number
HCFC-21 (CHFCl2) Dichlorofluoromethane	1.7		0.04	151	75-43-4
HCFC-22 (CHF2Cl) Monochlorodifluoromethane	11.9	0.04	0.055	1810	75-45-6
HCFC-31 (CH2FCl) Monochlorofluoromethane			0.02		593-70-4
HCFC-121 (C2HFCl4) Tetrachlorofluoroethane			0.01-0.04		354-14-3
HCFC-122 (C2HF2Cl3) Trichlorodifluoroethane			0.02-0.08		354-21-2
HCFC-123 (C2HF3Cl2) Dichlorotrifluoroethane	1.3	0.01	0.02	77	306-83-2
HCFC-124 (C2HF4Cl) Monochlorotetrafluoroethane	5.9	0.022	0.022	609	2837-89-0
HCFC-131 (C2H2FCl3) Trichlorofluoroethane			0.007-0.05		359-28-4
HCFC-132b (C2H2F2Cl2) Dichlorodifluoroethane			0.008- 0.05		1649-08-7
HCFC-133a (C2H2F3Cl) Monochlorotrifluoroethane			0.02 - 0.06		75-88-7
HCFC-141b (C2H3FCl2) Dichlorofluoroethane	9.2	0.12	0.11	725	1717-00-6
HCFC-142b (C2H3F2Cl) Monochlorodifluoroethane	17.2	0.06	0.065	2310	75-68-3
HCFC-221 (C3HFCl6) Hexachlorofluoropropane			0.015-0.07		422-26-4
HCFC-222 (C3HF2Cl5) Pentachlorodifluoropropane			0.01-0.09		422-49-1
HCFC-223 (C3HF3Cl4) Tetrachlorotrifluoropropane			0.01-0.08		422-52-6
HCFC-224 (C3HF4Cl3) Trichlorotetrafluoropropane			0.01-0.09		422-54-8
HCFC-225ca (C3HF5Cl2) Dichloropentafluoropropane	1.9	0.02	0.025	122	422-56-0
HCFC-225cb (C3HF5Cl2) Dichloropentafluoropropane	5.9	0.03	0.033	595	507-55-1
HCFC-226 (C3HF6Cl) Monochlorohexafluoropropane			0.02 - 0.1		431-87-8

HCFC-231 (C3H2FCl5) Pentachlorofluoropropane			0.05 - 0.09		421-94-3
HCFC-232 (C3H2F2Cl4) Tetrachlorodifluoropropane			0.008 - 0.1		460-89-9
HCFC-233 (C3H2F3Cl3) Trichlorotrifluoropropane			0.007 - 0.23		7125-84-0
HCFC-234 (C3H2F4Cl2) Dichlorotetrafluoropropane			0.01 - 0.28		425-94-5
HCFC-235 (C3H2F5Cl) Monochloropentafluoropropane			0.03 - 0.52		460-92-4
HCFC-241 (C3H3FCl4) Tetrachlorofluoropropane			0.004 - 0.09		666-27-3
HCFC-242 (C3H3F2Cl3) Trichlorodifluoropropane			0.005 - 0.13		460-63-9
HCFC-243 (C3H3F3Cl2) Dichlorotrifluoropropane			0.007 - 0.12		460-69-5
HCFC-244 (C3H3F4Cl) Monochlorotetrafluoropropane			0.009 - 0.14		
HCFC-251 (C3H4FCl3) Monochlorotetrafluoropropane			0.001 - 0.01		421-41-0
HCFC-252 (C3H4F2Cl2) Dichlorodifluoropropane			0.005 - 0.04		819-00-1
HCFC-253 (C3H4F3Cl) Monochlorotrifluoropropane			0.003 - 0.03		460-35-5
HCFC-261 (C3H5FCl2) Dichlorofluoropropane			0.002 - 0.02		420-97-3
HCFC-262 (C3H5F2Cl) Monochlorodifluoropropane			0.002 - 0.02		421-02-03
HCFC-271 (C3H6FCl) Monochlorofluoropropane			0.001 - 0.03		430-55-7

Why are there multiple values given for the ODPs and GWPs?

The numbers in the "ODP1" column are from the Montreal Protocol. Some numbers have been updated as per amendments to the protocol. Data in the "ODP2" column come from WMO's Scientific Assessment of Ozone Depletion: 2010. ODP values listed are semi-empirical and can be found in Table 5-1 of the document. All GWP values represent global warming potential over a 100-year time horizon. The numbers are from the IPCC Fourth Assessment Report: Climate Change 2007. The values listed are for direct radiative forcing and can be found in Table 2.14 of the document.

References

- WMO (World Meteorological Organization), Scientific Assessment of Ozone Depletion: 2010, Global Ozone Research and Monitoring Project—Report No. 52, 516 pp., Geneva, Switzerland, 2011.
- IPCC (Intergovernmental Panel on Climate Change). *Special Report on Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons,* Special Report of the Intergovernmental Panel on Climate Change, Cambridge, England, 2005.
- IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp.