

ANNEX I

OZONE-DEPLETING SUBSTANCES REFERRED TO IN ARTICLE 2, POINT (A) ⁽¹⁾

Group	Substance			Ozone-depleting potential (ODP) ⁽¹⁾	Global warming potential (GWP) ⁽²⁾
Group I	CFCl ₃	CFC-11	Trichlorofluoromethane	1,0	5 560
	CF ₂ Cl ₂	CFC-12	Dichlorodifluoromethane	1,0	11 200
	C ₂ F ₃ Cl ₃	CFC-113	Trichlorotrifluoroethane	0,8	6 520
	C ₂ F ₄ Cl ₂	CFC-114	Dichlorotetrafluoroethane	1,0	9 430
	C ₂ F ₅ Cl	CFC-115	Chloropentafluoroethane	0,6	9 600
Group II	CF ₃ Cl	CFC-13	Chlorotrifluoromethane	1,0	16 200
	C ₂ FCl ₅	CFC-111	Pentachlorofluoroethane	1,0	(*)
	C ₂ F ₂ Cl ₄	CFC-112	Tetrachlorodifluoroethane	1,0	4 620
	C ₃ FCl ₇	CFC-211	Heptachlorofluoropropane	1,0	(*)
	C ₃ F ₂ Cl ₆	CFC-212	Hexachlorodifluoropropane	1,0	(*)
	C ₃ F ₃ Cl ₅	CFC-213	Pentachlorotrifluoropropane	1,0	(*)
	C ₃ F ₄ Cl ₄	CFC-214	Tetrachlorotetrafluoropropane	1,0	(*)
	C ₃ F ₅ Cl ₃	CFC-215	Trichloropentafluoropropane	1,0	(*)
	C ₃ F ₆ Cl ₂	CFC-216	Dichlorohexafluoropropane	1,0	(*)
	C ₃ F ₇ Cl	CFC-217	Chloroheptafluoropropane	1,0	(*)
Group III	CF ₂ BrCl	halon-1211	Bromochlorodifluoromethane	3,0	1 930
	CF ₃ Br	halon-1301	Bromotrifluoromethane	10,0	7 200
	C ₂ F ₄ Br ₂	halon-2402	Dibromotetrafluoroethane	6,0	2 170
	CB ₂ F ₂	halon-1202	Dibromodifluoromethane	1,25	216
Group IV	CCl ₄	CTC	Tetrachloromethane (carbon tetrachloride)	1,1	2 200
Group V	C ₂ H ₃ Cl ₃ ⁽³⁾	1,1,1-TCA	1,1,1-Trichloroethane (methylchloroform)	0,1	161
Group VI	CH ₃ Br	methyl bromide	Bromomethane	0,6	2,43

⁽¹⁾ This Annex includes the ozone-depleting substances and their isomers. As per Article 2, point (a), mixtures containing the ozone-depleting substances listed in this Annex are considered as ozone-depleting substances covered by this Regulation.

Group	Substance			Ozone-depleting potential (ODP) ⁽¹⁾	Global warming potential (GWP) ⁽²⁾
Group VII	CH ₂ Br ₂	HBFC-21 B2	Dibromofluoromethane	1,00	(*)
	CHF ₂ Br	HBFC-22 B1	Bromodifluoromethane	0,74	380
	CH ₂ FBr	HBFC-31 B1	Bromofluoromethane	0,73	(*)
	C ₂ HFBr ₄	HBFC-121 B4	Tetrabromofluoroethane	0,8	(*)
	C ₂ HF ₂ Br ₃	HBFC-122 B3	Tribromodifluoroethane	1,8	(*)
	C ₂ HF ₃ Br ₂	HBFC-123 B2	Dibromotrifluoroethane	1,6	(*)
	C ₂ HF ₄ Br	HBFC-124 B1	Bromotetrafluoroethane	1,2	201
	C ₂ H ₂ FBr ₃	HBFC-131 B3	Tribromofluoroethane	1,1	(*)
	C ₂ H ₂ F ₂ Br ₂	HBFC-132 B2	Dibromodifluoroethane	1,5	(*)
	C ₂ H ₂ F ₃ Br	HBFC-133 B1	Bromotrifluoroethane	1,6	177
	C ₂ H ₃ FBr ₂	HBFC-141 B2	Dibromofluoroethane	1,7	(*)
	C ₂ H ₃ F ₂ Br	HBFC-142 B1	Bromodifluoroethane	1,1	(*)
	C ₂ H ₄ FBr	HBFC-151 B1	Bromofluoroethane	0,1	(*)
	C ₃ HFBr ₆	HBFC-221 B6	Hexabromofluoropropane	1,5	(*)
	C ₃ HF ₂ Br ₅	HBFC-222 B5	Pentabromodifluoropropane	1,9	(*)
	C ₃ HF ₃ Br ₄	HBFC-223 B4	Tetrabromotrifluoropropane	1,8	(*)
	C ₃ HF ₄ Br ₃	HBFC-224 B3	Tribromotetrafluoropropane	2,2	(*)
	C ₃ HF ₅ Br ₂	HBFC-225 B2	Dibromopentafluoropropane	2,0	(*)
	C ₃ HF ₆ Br	HBFC-226 B1	Bromohexafluoropropane	3,3	(*)
	C ₃ H ₂ FBr ₅	HBFC-231 B5	Pentabromofluoropropane	1,9	(*)
	C ₃ H ₂ F ₂ Br ₄	HBFC-232 B4	Tetrabromodifluoropropane	2,1	(*)

Group	Substance			Ozone-depleting potential (ODP) ⁽¹⁾	Global warming potential (GWP) ⁽²⁾
	C ₃ H ₂ F ₃ Br ₃	HBFC-233 B3	Tribromotrifluoropropane	5,6	(*)
	C ₃ H ₂ F ₄ Br ₂	HBFC-234 B2	Dibromotetrafluoropropane	7,5	(*)
	C ₃ H ₂ F ₅ Br	HBFC-235 B1	Bromopentafluoropropane	1,4	(*)
	C ₃ H ₃ FBr ₄	HBFC-241 B4	Tetrabromofluoropropane	1,9	(*)
	C ₃ H ₃ F ₂ Br ₃	HBFC-242 B3	Tribromodifluoropropane	3,1	(*)
	C ₃ H ₃ F ₃ Br ₂	HBFC-243 B2	Dibromotrifluoropropane	2,5	(*)
	C ₃ H ₃ F ₄ Br	HBFC-244 B1	Bromotetrafluoropropane	4,4	(*)
	C ₃ H ₄ FBr ₃	HBFC-251 B1	Tribromofluoropropane	0,3	(*)
	C ₃ H ₄ F ₂ Br ₂	HBFC-252 B2	Dibromodifluoropropane	1,0	(*)
	C ₃ H ₄ F ₃ Br	HBFC-253 B1	Bromotrifluoropropane	0,8	(*)
	C ₃ H ₅ FBr ₂	HBFC-261 B2	Dibromofluoropropane	0,4	(*)
	C ₃ H ₅ F ₂ Br	HBFC-262 B1	Bromodifluoropropane	0,8	(*)
	C ₃ H ₆ FBr	HBFC-271 B1	Bromofluoropropane	0,7	(*)
Group VIII	CHFCl ₂	HCFC-21 ⁽⁴⁾	Dichlorofluoromethane	0,040	160
	CHF ₂ Cl	HCFC-22 ⁽³⁾	Chlorodifluoromethane	0,055	1 960
	CH ₂ FCl	HCFC-31	Chlorofluoromethane	0,020	79,4
	C ₂ HFCl ₄	HCFC-121	Tetrachlorofluoroethane	0,040	58,3
	C ₂ HF ₂ Cl ₃	HCFC-122	Trichlorodifluoroethane	0,080	56,4
	C ₂ HF ₃ Cl ₂	HCFC-123 ⁽³⁾	Dichlorotrifluoroethane	0,020	90,4
	C ₂ HF ₄ Cl	HCFC-124 ⁽³⁾	Chlorotetrafluoroethane	0,022	597
	C ₂ H ₂ FCl ₃	HCFC-131	Trichlorofluoroethane	0,050	30 ⁽³⁾

Group	Substance			Ozone-depleting potential (ODP) ⁽¹⁾	Global warming potential (GWP) ⁽²⁾
	C ₂ H ₂ F ₂ Cl ₂	HCFC-132	Dichlorodifluoroethane	0,050	122
	C ₂ H ₂ F ₃ Cl	HCFC-133	Chlorotrifluoroethane	0,060	275 ⁽⁴⁾
	C ₂ H ₃ FCl ₂	HCFC-141	Dichlorofluoroethane	0,070	46,6
	CH ₃ CFCl ₂	HCFC-141b ⁽³⁾	1,1-Dichloro-1-fluoroethane	0,110	860
	C ₂ H ₃ F ₂ Cl	HCFC-142	Chlorodifluoroethane	0,070	175 ⁽⁴⁾
	CH ₃ CF ₂ Cl	HCFC-142b ⁽³⁾	1-Chloro- 1,1-difluoroethane	0,065	2 300
	C ₂ H ₄ FCl	HCFC-151	Chlorofluoroethane	0,005	10 ⁽⁴⁾
	C ₃ HFCl ₆	HCFC-221	Hexachlorofluoropropane	0,070	110 ⁽⁴⁾
	C ₃ HF ₂ Cl ₅	HCFC-222	Pentachlorodifluoropropane	0,090	500 ⁽⁴⁾
	C ₃ HF ₃ Cl ₄	HCFC-223	Tetrachlorotrifluoropropane	0,080	695 ⁽⁴⁾
	C ₃ HF ₄ Cl ₃	HCFC-224	Trichlorotetrafluoropropane	0,090	1 090 ⁽⁴⁾
	C ₃ HF ₅ Cl ₂	HCFC-225	Dichloropentafluoropropane	0,070	1 560 ⁽⁴⁾
	CF ₃ CF ₂ CHCl ₂	HCFC-225ca ⁽³⁾	3,3-Dichloro-1,1,1,2,2-pentafluoropropane	0,025	137
	CF ₂ ClCF ₂ CHClF	HCFC-225cb ⁽³⁾	1,3-Dichloro-1,1,2,2,3-pentafluoropropane	0,033	568
	C ₃ HF ₆ Cl	HCFC-226	Chlorohexafluoropropane	0,100	2 455 ⁽⁴⁾
	C ₃ H ₂ FCl ₅	HCFC-231	Pentachlorofluoropropane	0,090	350 ⁽⁴⁾
	C ₃ H ₂ F ₂ Cl ₄	HCFC-232	Tetrachlorodifluoropropane	0,100	690 ⁽⁴⁾
	C ₃ H ₂ F ₃ Cl ₃	HCFC-233	Trichlorotrifluoropropane	0,230	1 495 ⁽⁴⁾
	C ₃ H ₂ F ₄ Cl ₂	HCFC-234	Dichlorotetrafluoropropane	0,280	3 490 ⁽⁴⁾
	C ₃ H ₂ F ₅ Cl	HCFC-235	Chloropentafluoropropane	0,520	5 320 ⁽⁴⁾

Group	Substance			Ozone-depleting potential (ODP) ⁽¹⁾	Global warming potential (GWP) ⁽²⁾
	C ₃ H ₃ FC ₄	HCFC-241	Tetrachlorofluoropropane	0,090	450 ⁽⁴⁾
	C ₃ H ₃ F ₂ Cl ₃	HCFC-242	Trichlorodifluoropropane	0,130	1 025 ⁽⁴⁾
	C ₃ H ₃ F ₃ Cl ₂	HCFC-243	Dichlorotrifluoropropane	0,120	2 060 ⁽⁴⁾
	C ₃ H ₃ F ₄ Cl	HCFC-244	Chlorotetrafluoropropane	0,140	3 360 ⁽⁴⁾
	C ₃ H ₄ FC ₃	HCFC-251	Trichlorofluoropropane	0,010	70 ⁽⁴⁾
	C ₃ H ₄ F ₂ Cl ₂	HCFC-252	Dichlorodifluoropropane	0,040	275 ⁽⁴⁾
	C ₃ H ₄ F ₃ Cl	HCFC-253	Chlorotrifluoropropane	0,030	665 ⁽⁴⁾
	C ₃ H ₅ FC ₂	HCFC-261	Dichlorofluoropropane	0,020	84 ⁽⁴⁾
	C ₃ H ₅ F ₂ Cl	HCFC-262	Chlorodifluoropropane	0,020	227 ⁽⁴⁾
	C ₃ H ₆ FC	HCFC-271	Chlorofluoropropane	0,030	340 ⁽⁴⁾
Group IX	CH ₂ BrCl	BCM	Bromochloromethane	0,12	4,74

⁽¹⁾ The figures relating to ODP are estimates based on existing knowledge and will be reviewed and revised periodically in the light of decisions taken by the Parties.

⁽²⁾ Based on the Sixth Assessment Report, Chapter 7: The Earth's energy budget, climate feedbacks, and climate sensitivity – Supplementary Material adopted by the Intergovernmental Panel on Climate Change, unless otherwise indicated.

^(*) Default value, GWP not yet available.

⁽³⁾ This formula does not refer to 1,1,2-trichloroethane.

⁽⁴⁾ Identifies the most commercially viable substance as prescribed in the Protocol.

⁽⁵⁾ Scientific Assessment of Ozone Depletion: 2018; Appendix A Summary of Abundances, Lifetimes, Ozone Depletion Potentials (ODPs), Radiative Efficiencies (REs), Global Warming Potentials (GWPs), and Global Temperature change Potentials (GTPs).

ANNEX II

OZONE-DEPLETING SUBSTANCES REFERRED TO IN ARTICLE 2, POINT (A), NOT CONTROLLED UNDER THE PROTOCOL ⁽¹⁾

Substance		Ozone-depleting potential (ODP) ⁽¹⁾	Global warming potential (GWP) ⁽²⁾
C ₃ H ₇ Br	1-Bromopropane (n-propyl bromide)	0,02 – 0,10	0,052
C ₂ H ₅ Br	Bromoethane (ethyl bromide)	0,1 – 0,2	0,487
CF ₃ I	Trifluoroiodomethane (trifluoromethyl iodide)	0,01 – 0,02	(*)
CH ₃ Cl	Chloromethane (methyl chloride)	0,02	5,54
C ₃ H ₂ BrF ₃	2-bromo-3,3,3-trifluoroprop-1-en (2-BTP)	< 0,05 ⁽³⁾	(*)
CH ₂ Cl ₂	Dichloromethane (DCM)	non zero ⁽⁴⁾	11,2
C ₂ Cl ₄	Tetrachloroethene (Perchloroethylene (PCE))	0,006 – 0,007 ⁽³⁾	(*)

⁽¹⁾ The figures relating to ODP are estimates based on existing knowledge and will be reviewed and revised periodically in the light of decisions taken by the Parties.

⁽²⁾ Based on the Sixth Assessment Report, Chapter 7: The Earth's energy budget, climate feedbacks, and climate sensitivity – Supplementary Material adopted by the Intergovernmental Panel on Climate Change, unless otherwise indicated.

(*) Default value, GWP not yet available.

⁽³⁾ Scientific Assessment of Ozone Depletion: 2018; Appendix A Summary of Abundances, Lifetimes, Ozone Depletion Potentials (ODPs), Radiative Efficiencies (REs), Global Warming Potentials (GWPs), and Global Temperature change Potentials (GTPs).

⁽⁴⁾ New Ozone-Depleting substances that have been reported by the Parties: Decisions XIII/5, X/8 and IX/24 (Updated May 2012). https://ozone.unep.org/resources?term_node_tid_depth%5B883%5D=883

⁽¹⁾ This Annex includes the ozone-depleting substances and their isomers. As per Article 2, point (a), mixtures containing the ozone-depleting substances listed in this Annex are considered as ozone-depleting substances covered by this Regulation.

ANNEX III

PROCESS AGENTS

Processes referred to in Article 7 shall be any of the following:

- (a) use of carbon tetrachloride for the elimination of nitrogen trichloride in the production of chlorine and caustic soda;
- (b) use of carbon tetrachloride in the manufacture of chlorinated rubber;
- (c) use of carbon tetrachloride in the manufacture of poly-phenylene-terephthalamide;
- (d) use of CFC-12 in the photochemical synthesis of perfluoropolyetherpolyperoxide precursors of Z-perfluoropolyethers and difunctional derivatives;
- (e) use of carbon tetrachloride in the production of cyclodime.

The maximum quantity of ozone-depleting substances that may be used as process agents within the Union shall not exceed 921 metric tonnes per year. The maximum quantity of ozone-depleting substances that may be released from process agent uses within the Union shall not exceed 15 metric tonnes per year.

ANNEX IV

CONDITIONS FOR THE PLACING ON THE MARKET AND SUBSEQUENT SUPPLY OR MAKING AVAILABLE OF OZONE-DEPLETING SUBSTANCES FOR ESSENTIAL LABORATORY AND ANALYTICAL USES AS REFERRED TO IN ARTICLE 8(6)

1. Ozone-depleting substances for essential laboratory and analytical uses shall be of the following purities:

Substance	%
CTC (reagent grade)	99,5
1,1,1-trichloroethane	99,0
CFC 11	99,5
CFC 13	99,5
CFC 12	99,5
CFC 113	99,5
CFC 114	99,5
Other ozone-depleting substances with a boiling point > 20 °C	99,5
Other ozone-depleting substances with a boiling point < 20 °C	99,0

Those ozone-depleting substances may be subsequently mixed by producers, agents, or distributors with other chemicals whether or not subject to control under the Protocol as is customary for essential laboratory and analytical uses.

2. Ozone-depleting substances referred to in point 1 and mixtures containing those substances shall be supplied only in reclosable containers or in high pressure cylinders smaller than 3 dm³ or in 10 cm³ or smaller glass ampoules, marked clearly as substances that deplete the ozone layer, restricted to essential laboratory and analytical uses and specifying that used or surplus substances are to be collected and recycled, if practical. The material shall be destroyed if recycling is not practical.
3. Used or surplus ozone-depleting substances referred to in point 1 and mixtures containing those substances shall be collected and recycled if practical. Those substances and mixtures containing those substances shall be destroyed, if recycling is not practical.