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A REVIEW OF GOVERNMENT RESPONSES TO GOVERNING  
COUNCIL DECISION 8/7B AND 9/13B CONCERNING  
CHLOROFLUOROCARBONS AND RISKS TO THE OZONE  
LAYER

prepared

by

the UNEP Secretariat



A REVIEW OF GOVERNMENT RESPONSES TO GOVERNING  
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1. Governing Council decision 9/13B of 26 May 1981 concerning Protection of the Ozone Layer, in addition to the decision to initiate work aimed at the elaboration of a global framework convention for the protection of the ozone layer requested the Executive Director to invite the Co-ordinating Committee on the Ozone Layer, as part of the activities under its mandate to inter alia:

Compile all relevant information, including statistical and technical data, on the implementation of the recommendations contained in decision 8/7B of 29 April 1980, in particular that relating to reduction in the use of chlorofluorocarbons (CFCs) 11 and 12, as well as to production capacity on the basis of an agreed definition.

... 2. The full text of decision 9/13B is attached as Annex I and the text of decision 8/7B is attached as Annex II. The agreed definition of production capacity can be found in Annex III to the document.

3. In order that the relevant information could be made available to the Co-ordinating Committee on the Ozone Layer, the Acting Assistant Executive Director, Office of the Environment Programme, communicated with all Governments on 21 July 1981 requesting the necessary information designated in the above decision and, in addition, requesting information on the production and release of other substances identified by the Co-ordinating Committee on the Ozone Layer at its fourth session in Villach in November 1980, as potential depletors of the stratospheric ozone layer. The text of the letter is reproduced as Annex IV.

4. On the basis of the replies received, a preliminary report was made to the Co-ordinating Committee on the Ozone Layer at its fifth session at Copenhagen, Denmark in October 1981. Since then, further information has been received by the UNEP Secretariat and the following is a brief summary of all the information concerning the production and release of chlorofluorocarbons 11 and 12 and other potential ozone depleting substances which has been made available to the UNEP Secretariat.

5. Replies to the Acting Assistant Executive Director's letter of 21 July 1981 presently number 20. A brief summary of these replies follows:

(i) New Zealand

Chlorofluorocarbons are not produced in New Zealand. Imports amounts are small. In 1979 less than 1500 tonnes (0.05% of world use) were imported. Details of chlorofluorocarbon use by category - foams, refrigeration and aerosols (personal, household, industrial and other).

(ii) Sri Lanka

1979/80 import statistics for chlorocarbons - Vinyl Chloride, Trichloroethylene, Tetrachloroethylene, chloroform and others.

No production data for CFCs provided.



(iii) Singapore

No production of CFCs. No use-data provided.

(iv) Malta

No production of CFCs. Use data to be available in 1982 when a register of imported chemicals will be completed.

(v) Senegal

No production of CFCs. The country uses approximately 300-400 kg. of CFCs per day giving an annual use total of 120-160 tonnes. Use of CFCs in Senegal is mainly confined to closed circuit systems such as refrigeration and air-conditioning. No information on other halocarbons is currently available.

(vi) Denmark

CFCs are not produced. Use data supplied by category (aerosols, cooling, foam, solvent, other uses). In addition, trends in CFCs 11 and 12 useage since 1979 and use data for other chloro-fluorocarbons F113, F114 and F116 by category (aerosols, cooling, solvents) are also included.

(vii) Romania

No production of CFCs 11, 12, 113, 114 and 115.

Production data and production capacity supplied for methyl chloroform and carbon tetrachloride.

(viii) Switzerland

The Swiss authorities are in contact with the aerosol industry in their country to ensure the voluntary reductions in the use of CFCs as propellants and report a 35.1% decrease in industrial use of CFCs for filling aerosols. The proportion by volume of CFCs used as propellants of the total consumption of CFCs has fallen to 57% from 83% in the past three years.

Consumption of CFCs for uses other than as aerosols is estimated to be about 500 tonnes per year with nearly 90% of CFCs industrially processed in Switzerland used as aerosols.

No CFCs are manufactured in Switzerland.

(ix) Austria

No CFC production in Austria and no available information on use.

(x) Venezuela

There is no information available on production and use of CFCs.

(xi) Brazil

Information supplied on production and production capacity of CFCs 11, 12 and 22. Production data for Carbon Tetrachloride and Methyl Chloroform are also supplied.



(xii) Malaysia

No production of CFCs. No data on importation and use supplied.

(xiii) Greece

No information on production and production capacity given with respect to CFC emissions; the Greek Government follows EEC regulations. No figures are given.

(xiv) Turkey

No production of CFCs. Turkey does import CFCs for some industries but no details are given.

(xv) Canada

Production data, production capacity and sales information for CFCs 11, 12 and 22 are supplied although it is pointed out that CFC production data in Canada are classified as 'proprietary' under the Canada Environmental Contaminants Act and as such data is not available from Federal Government sources.

(xvi) Italy

Acknowledgement of the UNEP request but no data supplied.

(xvii) Federal Republic of Germany

Information on CFC use in aerosols has been supplied together with information on production of other halogenated compounds within the Federal Republic of Germany during 1979, and estimated emission data for other compounds. No data on production capacity is available due to regulations on the protection of competition.

(xviii) United Kingdom of Great Britain and Northern Ireland

The United Kingdom follows EEC decisions on CFCs and gives production capacity data of the 10 producers within the Community as 480,000 tons per annum based on the agreed definition and an average of 332 working days per year. These figures cannot be broken down into national figures under EEC rules for the protection of commercial interests.

The United Kingdom reduction in the use of CFCs 11 and 12 in aerosol cans have been reduced by about 30%, compared with the 1976 figure, against an overall reduction in use for Europe as a whole of about 35%.

No information on production and use of CFCs 113 and 114, methyl chloroform and carbontetrachloride is given although it is noted that the European manufacturers have agreed to monitor their own output of CFCs 113 and 114 and will inform the EC Commission when this exceeds a certain figure.

(xix) Kenya

Acknowledgement only.

(xx) Burma

Acknowledgement only.



6. Where considered necessary, the full text of replies by Governments are attached as Annex IV of this report. In addition to the above reports, information on methylchloroform produced by PPG industries of Pitsburg, USA have been received by that company, following a request for such information being received from the Chemical Manufacturer's Association, a member of the UNEP Co-ordinating Committee on the Ozone Layer. PPG have informed UNEP that their nameplate capacity for methylchloroform is 164,000 short tons per year. They estimate the chlorinated solvent industry to be operating at 50 to 60 per cent of nameplate capacity.

7. In addition to the above, nineteen Governments have acknowledged UNEP's letter of 3 July 1980 informing them of decision 8/7B, recommending the reduction in use of CFCs and encouraging the development of ways to control releases into the atmosphere. The letter also invited Governments' view on the most appropriate method of accelerating international cooperation on the subject. Most replies informed on national regulations to reduce the emission of CFCs. Many called for intensified research programmes and several considered the development of an international convention for the protection of the ozone layer an appropriate step for accelerating international cooperation.

8. It was clear from some of the replies received that the ozone issue as a global concern was occasionally misunderstood. Several countries stated that as they were not users of CFCs, 'their ozone layer' was not in danger and the problem was therefore that of the countries engaged in the manufacture and use of such chemicals.



DECISION 9/13B OF THE GOVERNING COUNCIL OF UNEP  
REGARDING CHLOROFLUOROCARBONS

The Governing Council,

Recalling its decision 84 C (V) of 25 May 1977 on the establishment of the Co-ordinating Committee on the Ozone Layer and on the World Plan of Action on the Ozone Layer,

Recalling further its decision 8/7B of 29 April 1980 on measures relating to the protection of the ozone layer,

Noting that the latter decision recommends that the use of chlorofluorocarbons 11 and 12 be significantly reduced, and that production capacity should not be increased,

Noting further the importance of obtaining detailed information on the implementation of the decision,

Recognizing to this effect the desirability of initiating work aimed at the elaboration of a global framework convention which would cover monitoring, scientific research and the development of best available and economically feasible technologies to limit and gradually reduce emissions of ozone-depleting substances, as well as the development of appropriate strategies and policies,

Recognizing further the role and mandate of the United Nations Environment Programme in protecting and enhancing the global environment,

Noting with appreciation the work of the Co-ordinating Committee on the Ozone Layer,

1. Decides to initiate work aimed at the elaboration of a global framework convention for the protection of the ozone layer;

2. Further decides to this end to establish an ad hoc working group of legal and technical experts nominated by interested Governments and intergovernmental organizations, which shall report, through the Executive Director, to the Governing Council on the progress of its work;

3. Requests the Executive Director:

(a) To ensure that in the work so initiated, all relevant information and related work currently under way in other forums, as well as the results of any discussions on this subject at the Ad Hoc Meeting of Senior Government Officials Expert in Environmental Law are taken into account;

(b) To invite the Co-ordinating Committee on the Ozone Layer, as part of its activities under its mandate:

(i) To contribute to the work of the ad hoc working group;

(ii) To compile all relevant information, including statistical and technical data, on the implementation of the recommendations contained in decision 8/7B of 29 April 1980, in particular that relating to reduction in the use of chlorofluorocarbons 11 and 12, as well as to production capacity on the basis of an agreed definition;



(c) To assist and support the ad hoc working group in its preparatory work;

(d) To submit to the Governing Council at its tenth session, with his comments, the first progress report of the ad hoc working group;

4. Welcomes the offer of the Swedish Government to host the first meeting of the ad hoc working group.

*implicitly  
the second  
term is  
not excluded*

9th meeting

26 May 1981



DECISION 8/7B OF THE GOVERNING COUNCIL OF UNEP  
REGARDING CHLOROFLUOROCARBONS

The Governing Council,

Recalling its decision 84 (V) C of 25 May 1977 on the ozone layer, noting with approval the work of the Co-ordinating Committee on the Ozone Layer, noting also the increasing scientific concern at the harmful effects on the ozone layer of the release of chlorofluorocarbons into the atmosphere, welcoming the steps taken by the scientific community to increase understanding of the processes at work and to pool knowledge internationally, appreciating the steps already taken by several Governments and the European Economic Community to limit the production capacity of chlorofluorocarbons and their uses and recognizing that preventive measures are required on a global scale, and considering that in the present state of scientific knowledge precautionary measures should be taken to limit global production and use, in particular, of the chlorofluorocarbons F-11 and F-12 and that investigations should be pursued into all chlorofluorocarbon emissions;

1. Calls the attention of Governments to the report of the third session of the Co-ordinating Committee on the Ozone Layer;
2. Recommends that Governments, especially those of countries where use of the chlorofluorocarbons F-11 and F-12 is high, should achieve significant reductions in use and encourage the development of ways to control releases into the atmosphere;
3. Urges Governments to continue to encourage further scientific research in this field and to support the development of substitute substances or techniques which are not harmful to the environment;
4. Recommends that production capacity for the chlorofluorocarbons F-11 and F-12 should not be increased;
5. Further recommends that the measures already taken be re-examined in the light of the scientific, technical and economic data available;
6. Invites the Executive Director to consider ways of accelerating international co-operation on the subject and to report thereon to the Governing Council.

12th meeting  
29 April 1980



DEFINITION OF PRODUCTION CAPACITY

Production capacity should:

- (a) Be expressed in tons per year;
- (b) Reflect full capacity in 24 hours continuous service, multiplied by the average number of days per year the plants are able to run under normal conditions of maintenance and safe operability;
- (c) Include all lines capable of producing chlorofluorocarbons 11 and 12 either exclusively or on a campaign basis.



LETTER OF 21 JULY 1981 FROM THE ACTING ASSISTANT  
EXECUTIVE DIRECTOR, OFFICE OF THE ENVIRONMENT  
PROGRAMME, TO ALL GOVERNMENTS

Sir,

I have the honour to bring to your attention, decision 9/13B of 26 May 1981 of the Governing Council of the United Nations Environment Programme (UNEP), concerning the protection of the ozone layer, adopted on 26 May 1981.

In noting with appreciation the work of the Co-ordinating Committee on the Ozone Layer, the Council by the above decision requests the Executive Director to invite the Committee, as part of its activities under its mandate, inter alia to compile all relevant information, including statistical and technical data, on the implementation of the recommendations contained in decision 8/7B of 29 April 1980, in particular that relating to reduction in the use of chlorofluorocarbons 11 and 12, as well as to production capacity on the basis of an agreed definition.

With regard to the definition of production capacity, the following is suggested for use by the relevant authorities in your country. Production capacity should:

- (a) Be expressed in tons per year;
- (b) Reflect full capacity in 24 hours continuous service multiplied by the average number of days per year the plants are able to run under normal conditions of maintenance and safe operability;
- (c) Include all lines capable of producing chlorofluorocarbons 11 and 12 either exclusively or on a campaign basis.

If possible, it would be preferable if data on compound plants were reported separately from those producing chlorofluorocarbons 11 and 12 exclusively.

In addition, I should be grateful if those Governments who have not yet responded substantively to the Executive Director's letter of 3 July 1980, requesting views on the most appropriate ways of accelerating international co-operation with regard to limiting the production of chlorofluorocarbons 11 and 12, would give this matter their attention.

I wish also to draw your attention to paragraph 34 of the report of the Co-ordinating Committee on the Ozone Layer at its fourth session, held at Bilthoven, Netherlands, from 11 to 14 November 1980:

"Production data and atmospheric measurements for other halocarbons which may also produce ozone depletion are less extensive than those for CFC-11 and CFC-12. Apart from methyl chloride, which is of non-industrial origin, the most significant of these other chlorine containing compounds are methyl chloroform ( $\text{CH}_3\text{CCl}_3$ ), carbon tetrachloride ( $\text{CCl}_4$ ) and CFC-113 ( $\text{CCl}_2\text{F}$ ) but there are a number of others which need to be considered in a full statement. On current estimates these substances would cause in the steady state an additional ozone depletion of about a third of that due to CFC-11 and CFC-12 if current releases continued indefinitely. However, the production of methyl chloroform and some others has



grown substantially in the recent past and there has been a corresponding increase in atmospheric concentrations though these data are rather fragmentary. If this growth were to continue while the production of CFC-11 and CFC-12 remains constant or declines, then these other compounds could assume an importance equal to that of CFC-11 and CFC-12 at some time in the future. Thus there is a clear need to acquire relevant global release data and to extend corresponding atmospheric measurements".

In view of this need identified by the Co-ordinating Committee on the Ozone Layer, I would appreciate receiving all information regarding release data concerning these chemicals, and in addition, information concerning the release of CFC-114 and CFC-115.

In order that all relevant information can be made available to the Co-ordinating Committee on the Ozone Layer at its fifth meeting scheduled for 12 to 16 October 1981, I should be grateful if the information requested in this letter could be sent to me not later than 1 September 1981.

Accept, Sir, the assurances of my highest consideration.

Francesco Sella  
Acting Assistant Executive Director  
Office of the Environment Programme



FULL TEXT OF REPLIES BY SOME GOVERNMENTSNEW ZEALAND

The amounts used, in tonnes, are shown below for the Aerosol Industry. These have been obtained from the Department of Trade and Industry, (1974, 1976 and 1977) and from the New Zealand Manufacturer's Association

	1974	1976	1977	1978	1979	1980 (Predicted)
<u>Aerosols</u>						
Personal	803	656	595	474	462	418
Household	392	267	334	118	43	36
Industrial and other	174	232	254	201	188	156
<b>TOTAL</b>	<b>1367</b>	<b>1155</b>	<b>1183</b>	<b>793*</b>	<b>693*</b>	<b>610*</b>

\* Figures obtained from all major users - one firm has not responded.

The Commission for the Environment wrote to importers of chlorofluorocarbons (on the understanding that the chemical was likely to be imported by these firms only) and received the following amounts in tonnes of the chlorofluorocarbons F-11 and F-12 supplied to refrigeration manufacturers and foam manufacturers for the last three years:

	1978	1979	1980 (estimated)
Manufacture			
Foam	331	402	467
Refrigeration	347	392	221*
<b>TOTAL</b>	<b>678</b>	<b>794</b>	<b>688</b>

\*Downturn in white-goods industry in New Zealand



SRI LANKA

BTN No.	DESCRIPTION	1979		1980	
		QUANTITY (KG)	VALUE (RS)	QUANTITY (KG)	VALUE (RS)
29.02A	Halogenated Derivatives of Hydrocarbons - Vinyl Chloride	14	3,786	-	-
29.02B	Halogenated Derivatives of Hydrocarbons - Trichloroethylene	45,462	691,617	35,010	912,752
29.02C	Halogenated Derivatives of Hydrocarbons - Tetrachloroethylene	1,007	36,486	2,768	133,329
29.02D1	Halogenated Derivatives of Hydrocarbons - Chloroform	4,976	261,859	6,493	218,698
29.02D2	Halogenated Derivatives of Hydrocarbons - Other	208,910	4,610,429	154,162	7,629,133

DENMARK

	<u>1976</u>	<u>1978</u>	<u>1979</u>
AEROSOLS	1824	1282	952
COOLING	969	912	1142
FOAM	1880	1726	2134
SOLVENT	39	99	111
OTHER	47	46	58
TOTAL:	4759	4065	4397

The figures show the following trend:

1. Aerosol use has decreased steadily, so the EEC decision about minimum 30 per cent reduction ultimo 1981 has already been fulfilled. Aerosol share in 1979 was 22 per cent.
2. Cooling use has been rather constant with an upward trend, share in 1979 was 26 per cent.
3. Foam use is increasing. Share in 1979 was 49 per cent.
4. Solvent use and use for other purposes is small, with an increasing trend. Share in 1979 was 4 per cent.



Figures specifically pertaining to use of F-113, F-114 and F-116 are as follows:

	<u>1976</u>	<u>1978</u>	<u>1979</u>
AEROSOLS	12	9	11
COOLING	23	20	17
SOLVENTS	39	99	111
TOTAL:	74	120	139

CFC is not produced in Denmark.

#### ROMANIA

En Roumanie il n'y a pas des installations produisant des chlorofluorocarbones 11, 12, 113, 114, 115.

En ce qui concerne d'autres composé halogénés qui entraînent également l'épuisement de la couche d'ozone, la production de ces substances a été en 1980 comme suit:

a. Production annuelle (en tonnes):		
chloroforme de méthyle ( $\text{CH}_2\text{CCl}$ )	-	226
tétrachlorure de carbon ( $\text{CCl}_4$ )	-	23.548
b. La capacité de production quotidienne:		
chloroforme de méthyle	-	3
tétrachlorure de carbon	-	72
c. Régime de fonctionnement (jours/an)		
chloroforme de méthyle	-	333
tétrachlorure de carbone	-	333
d. Capacité de production (tonnes/an)		
chloroforme de méthyle	-	1000
tétrachlorure de carbone	-	24.000



SWITZERLANDChlorofluorocarbons - the political and economic situation in Switzerland

At present in Switzerland there is no legal foundation which would be sufficient to permit solution of the problem of CFCs. However, since the autumn of 1979 proposals from the Federal Council for environmental protection legislation have been under consideration in Parliament. If the proposals are accepted, and providing that there is no fundamental change in the assessment of the expected effects of CFCs in the near future, the Federal Council plans, once the new law enters into force, to limit the use of CFCs in aerosols to the essential minimum (through a ban subject to exceptions).

The Swiss authorities are in close contact with the aerosol industry to ensure that voluntary reductions are made in the use of CFCs in packaging using propellants without awaiting further developments. As the attached table shows, the industry used 35.1 per cent less CFCs for filling aerosols in 1980 than in 1977. The proportion by volume of CFCs in total consumption of propellants has dropped from 83 per cent to around 57 per cent in three years.

Consumption of CFCs for purposes other than for aerosols is not known precisely; it is estimated at about 500 metric tons a year. According to the estimates, nearly 90 per cent of CFCs industrially processed in Switzerland are used for aerosols. No CFCs are produced in Switzerland.

As substitutes for CFCs, our country authorizes the use of propane, butane, dimethyl ether, etc., with certain restrictions imposed for safety reasons. For cosmetics (about 81 per cent of CFC consumption), the use of methylene chloride and 1,1,1-trichloroethane is not authorized.

Because of the preponderant use of CFCs in aerosols (mainly F11, F12 and F114), the Swiss authorities have concentrated their efforts on this sector; in other words, substances other than CFCs which are capable of contributing to degradation of the ozone layer have not been dealt with in the same way. Thus Switzerland has at present no figures on the use of methyl chloroform, carbon tetrachloride, etc.

## Consumption of propellants in Switzerland, 1977-80

		1977	1978	1979	1980
Total number of cans filled in Switzerland <sup>(a)</sup>	millions	52,63	44,09	50,02	46,97
Exports		7,96	6,76	8,74	7,43
Imports		3,68	2,34	4,88	5,53
Consumed in Switzerland		48,35	39,67	46,16	45,07
Total use of CFCs for filling cans <sup>(b)</sup>	metric tons	5913	4733	4565	3836
	percentage (1977=100%)	100	80,0	77,2	64,9
Proportion of CFCs in total consumption of propellants	vol-%	83	71	63	57

Sources: (a) Association suisse de l'industrie aérosol (ASA)  
(b) Enquête de l'ASA (sur proposition de l'Office fédéral de la protection de l'environnement)

100

10

10

10

10

10

BRAZILAnnual production

CFC 11 and CFC 12 ..... 12,000 tons/year

CFC 22 ..... 1,900 tons/year

Production capacity

CFC 11 and CFC 12 ..... 17,000 tons/year

CFC 22 ..... 5,500 tons/year

Carbon tetrachloride ( $\text{CCl}_4$ )... 31,000 tons/yearMethyl chloroform ( $\text{CH}_3\text{CCl}_3$ )... 55,000 tons/yearCANADA1. Canadian Production and Sales

It must be pointed out that CFC production data are classified as "proprietary" under the Canada Environmental Contaminants Act. Thus it is not possible to supply total Canadian production data from federal government sources. Nonetheless, production data are available in other forms - CPI Product Profiles and the CMA Alexander Grant Report (Canadian Production Data are aggregated in the World Production Figures). The following information should be of use:

i) Canadian Nameplate Production

Total nameplate production capacity for CFC-11, CFC-12 and CFC-22 was 32,000 metric tons in 1980. Total use of these products decreased from 21,500 metric tons in 1974 to 19,500 metric tons in 1978. (Source: CPI Product Profiles "Fluorochloro-methanes", Revised July 17, 1978 and January 15, 1980).

ii) Canadian CFC Sales

Data from industry indicate that 1980 sales (and hence usage) of CFC-11 and CFC-12 were approximately 55% and 60% respectively of their 1974 peak. The usage of CFC-22 has steadily increased since 1974.

CFC-115 is not produced in Canada, however, sales of this material were in the area of 400 metric tons in 1980. It was used primarily in refrigeration systems. We are unable to provide information on CFC-114 due to its proprietary nature.

2. UV-B Effects on Non-Human Biota

Presently, we are not aware of any ongoing or planned projects concerned with the effects of UV-B radiation on non-human targets.

3. Legislative/Administrative Arrangements

The Environmental Contaminants Act (ECA) which came into force in April 1976, is the appropriate (Canadian) legislation which is being used to protect the ozone layer from chemicals used in commerce. Under



this Act there are regulations to provide protection to the ozone layer. This Act and the regulations promulgated thereunder are specifically designed to protect human health and the environment from substances that contaminate the environment.

4. Acceleration of International Cooperation for Limiting Production of CFC-11 and CFC-12

Presently, it is considered that the only satisfactory way of accelerating international cooperation for limiting production of CFC-11 and CFC-12 would be by the provision of more and firmer scientific data on the measurement of the magnitude of any predicted or actual problem relating to the ozone layer. In particular, increased emphasis is needed in the development of an acceptable warning system which could provide sufficiently strong evidence to promote a desire to protect the environment.

FEDERAL REPUBLIC OF GERMANY

Estimates on the production of chlorinated methanes and ethanes in the Federal Republic of Germany (1979):

Compound	Tons
Methyl chloride ( $\text{CH}_3\text{Cl}$ )	50,000
Methylene chloride ( $\text{CH}_2\text{Cl}_2$ )	55,000
Chloroform ( $\text{CHCl}_3$ )	41,000
Carbon tetrachloride ( $\text{CCl}_4$ )	207,000
Dichloroethanes ( $\text{C}_2\text{H}_4\text{Cl}_2$ )	1,300,000
Trichloroethanes ( $\text{C}_2\text{H}_3\text{Cl}_3$ )	100,000
1,1,1-Trichloroethane ( $\text{CH}_3\text{CCl}_3$ )	32,000
Trichloroethylene ( $\text{C}_2\text{HCl}_3$ )	47,000
Perchloroethylene ( $\text{C}_2\text{Cl}_4$ )	126,000

Total emission data are varying from compound to compound and usually are not available. The emissions of  $\text{CCl}_4$  are estimated to amount 5,700 t/a, these for  $\text{CH}_3\text{CCl}_3$  ca 28,000 t/a in 1979.

