

- carbon tetrachloride and
- methyl chloroform.

All these chemicals have some degree of ozone depleting potential (ODP) and global warming potential (GWP). Another group of chemicals viewed as substitutes for the CFCs and HCFCs are hydrocarbons that do not contain chlorine or bromine, the molecules that cause the destruction of the ozone. These hydrofluorocarbons (HFCs) are not ozone depleting but may act as greenhouse gases.

ODP and GWP values have been calculated for most of the 50 or so chemicals that fall into these categories. In assessing their environmental acceptability, both indices need to be taken into account. Using these values, it is possible to estimate the changes in ozone depletion and global warming that could be expected should different practices and combinations of chemicals be selected to replace those now in use.

Figure 4 shows the relative ODP and GWP of selected substances that require control and some of their substitutes. It is evident from Figure 4 that use of the HCFC and HFC substitutes would substantially reduce damage to the atmosphere. It has been estimated that completely substituting HCFCs and HFCs for CFCs would result in a 90% reduction in the overall ODP. Figure 4 also illustrates the pronounced differences in ODP and GWP of the selected HCFCs and HFCs. These differences must be incorporated into government policy.

Halons were developed at the end of the Second World War and have grown in popularity as fire extinguishing agents, particularly for use on sophisticated electronic equipment because they are essentially inert and do not leave a residue. The largest release of halons, however, is from testing extinguishers rather than their use in actual fire fighting. There should, therefore, be substantial opportunity for their control even if their use continues. Halons have extremely high ODP (3-10). The GWP is known only for one of the halons, and its value is 0.8.

Carbon tetrachloride is used primarily as a feedstock in producing CFCs. At the time of signing the Montreal Protocol it was believed that controlling the major CFCs would result in the control of carbon tetrachloride as well. Rising levels in the atmosphere indicate, however, that this assumption was incorrect and that the non-feedstock uses of this toxic substance—such as a constituent in pesticides, as a dry cleaning agent, as a solvent in synthetic rubber and dyes, and as a grain fumigant—are substantial. The ODP of carbon tetrachloride is high (1.0-1.2) but the GWP is moderate (0.12).