

Which of the following compounds has the highest ozone depletion potential (ODP)?

- A. CCl₄ **B. CClF₂Br** C. N₂O D. CCl₃F

The stratospheric ozone layer helps filter the sun's harmful ultraviolet (UV) radiation from the earth. Increased UV radiation harms human health and damages animal and plant life. Evidence shows that the main causes of ozone depletion are the releases of manufactured chlorine and bromine-based chemicals such as chlorofluorocarbons (CFC's), halons and hydrochlorofluorocarbons (HCFC's) into the atmosphere. Hence, these chemicals are known as ozone depleting substances (ODS's). The main uses of these chemicals are in air conditioning, refrigeration and fire extinguishing equipment.

Ozone depleting substances vary in their capacity to destroy ozone molecules, so scientists have developed a method for characterizing the relative depletion caused by different ODS. Ozone Depleting Potential (ODP) is the ratio of calculated ozone column change for each mass unit of a gas emitted into the atmosphere relative to the calculated depletion for the reference gas CFC 11 (ODP = 1.0). This allows different chemicals to be compared using a common unit (CFC 11-equivalents). For example, a chemical such as Halon 2402 (ODP = 6) is six times more detrimental to the stratospheric ozone layer than CFC 11.

The Montreal Protocol is the first worldwide agreement designed to protect human health and the environment against the adverse effects of the depletion of the stratospheric ozone layer and maintains the list of ozone-depleting substances that are targeted for control practices, reductions, or total phase-outs.

More information:

1. <http://scorecard.goodguide.com/chemical-profiles/def/odp.html>
2. <https://www.environment.gov.au/protection/ozone/ozone-depleting-substances>
3. http://www.enr.gov.nt.ca/sites/default/files/guidelines/guideline_for_ozone_depleting_substances_and_halocarbon_alternatives.pdf