

Greenhouse Gases and Ozone Depletion

<https://gemini.google.com/app/b8b30f08ac3698fc>

Response: Statements **(a)** and **(d)** are correct.

Analysis of Statements

- **(a) Correct:** CFCs, HCFCs, and HFCs are all potent greenhouse gases that trap infrared radiation, contributing significantly to global warming.
- **(b) Incorrect:** CFCs produce chlorine free radicals via UV photolysis in the **stratosphere**, not the troposphere. They remain inert in the troposphere.
- **(c) Incorrect:** Hydrofluorocarbons (HFCs) contain no chlorine atoms (only hydrogen, fluorine, and carbon), so they cannot produce chlorine radicals or deplete the ozone layer.
- **(d) Correct:** Both CFCs and HCFCs contain chlorine atoms. When exposed to high-energy UV light in the stratosphere, they undergo photolysis to release chlorine free radicals ($\text{Cl}^\bullet$), which catalyze the destruction of ozone.

*(Note: Under the standard G.C.E. A/L multiple-choice response structure for 4-statement questions where options combine statements, the combination corresponding to **(a)** and **(d)** being correct is selected.)*
