

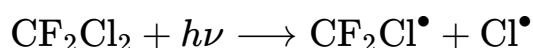
Atmospheric Chemistry of R-12

<https://gemini.google.com/app/93455f0edafd9e89>

Response: Dichlorodifluoromethane (CF_2Cl_2 , or R-12) is a chlorofluorocarbon (CFC).

Analysis of each statement:

- **(a) Correct:** R-12 is a volatile, highly unreactive gas in the troposphere with a long atmospheric lifetime, giving it high potential to diffuse up into the stratosphere.
- **(b) Correct:** In the troposphere, R-12 is stable because it does not react with hydroxyl ($\text{OH}^\bullet$) radicals or water. When it reaches the stratosphere, exposure to high-energy solar UV radiation photolyzes it, cleaving the C–Cl bond to release active chlorine free radicals ($\text{Cl}^\bullet$):



- **(c) Correct:** R-12 absorbs infrared radiation in the atmospheric window, making it a potent greenhouse gas that contributes significantly to global warming.
- **(d) Incorrect:** Photochemical smog occurs in the **troposphere** (ground-level ozone). R-12 is inert in the troposphere and only depletes **stratospheric ozone** (the ozone layer). It does not react with or deplete photochemical smog ozone.

Correct Statements

Statements **(a)**, **(b)**, and **(c)** are correct.

*(In standard G.C.E. A/L multiple-choice response schemes where options correspond to combinations like (a), (b), (c) being correct, the answer option is **1** or **(a), (b), (c)**).*
