

Freon Encyclopedia Article

Freon

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Freon

The generic name for several **chlorofluorocarbons** (CFCs) widely used in refrigerators and air conditioners, including the systems in houses and cars. Freon—comprised of **chlorine**, fluorine, and **carbon** atoms—is a non-toxic gas at room temperature. It is environmentally significant because it is extremely long-lived in the **atmosphere**, with a typical **residence time** of 70 years. This long life-span permits CFCs to disperse, ultimately reaching the **stratosphere** 19 mi (30 km) above the earth's surface. Here, high energy photons in sunlight break down freon, and chlorine atoms liberated during this process participate in other chemical reactions that consume **ozone**. The final result is to decrease the stratospheric ozone layer that shields the earth from damaging **ultraviolet radiation**. Under the 1987 Montreal Protocol, 31 industrialized countries agreed to phase out CFC freon production. Freon substitutes use **bromine** atoms to replace the chlorine atoms, providing a substitute refrigeration compound that appears less damaging, although considerably more expensive and less energy efficient.