

New greenhouse gas discovered by U of T chemists has highest impact on global warming

DISCUSSION QUESTIONS

1. What is the name of the newly discovered greenhouse gas?

Perfluorotributylamine (PFTBA)

2. Radiative efficiency describes how effective a molecule is at preventing long-wave radiation from escaping back into space. How is total climate impact determined?

Radiative efficiency multiplied by atmospheric concentration = total climate impact

3. Summarize the 3 reasons why PFTBA is dangerous to the environment.

No known processes can destroy PFTBA in lower atmosphere, so PFTBA has a long lifetime

PFTBA has very high radiative efficiency

Therefore PFTBA has a very high global warming potential

4. What products/processes produce PFTBA?

Human-produced for various applications in electrical equipment, used in thermally and chemically stable liquids marketed for use in electronic testing and as heat transfer agents

5. How much more of an impact does PFTBA have on climate in comparison to CO₂?

A single PFTBA molecule has the impact of 7100 molecules of CO₂

6. PFTBA is found in extremely low concentrations (0.18 parts per trillion) but it has a great impact on climate. If PFTBA concentrations increase, predict what will happen to the climate.

Greater heat trapping will occur in the atmosphere, which should lead to much more warming