

# Atmospheric Impact of *E*-CHF=CHCF<sub>3</sub> and *Z*-CHF=CHCF<sub>3</sub>: Importance of the Reaction with OH Radical

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Hydrofluoroolefins (HFOs) are the newest generation of compounds used as refrigerants, propellants and solvents in substitution of chlorofluorocarbons (CFCs). HFOs are characterized by their zero impact on stratospheric ozone and their lower contribution to global warming compared to previous generations of CFC replacements. In this work, we present a study of the atmospheric impact of two HFOs: the *trans*- and *cis*- isomers *E*-CHF=CHCF<sub>3</sub> and *Z*-CHF=CHCF<sub>3</sub>.

Among the possible degradation routes of these two isomers, we will show the importance of their reaction with hydroxyl (OH) radical as a function of temperature ( $T = 263 - 358$  K) and pressure ( $P = 50 - 300$  Torr). A pulsed laser photolysis – laser induced fluorescence (PLP - LIF) system has been used to generate and monitor OH radicals.<sup>1,2</sup> H<sub>2</sub>O<sub>2</sub> and HNO<sub>3</sub> have been used as OH precursors when photolyzed at 248 nm. Results will be discussed and compared with previous studies.<sup>3-5</sup> The differences observed between the two isomers will also be discussed.

UV-vis absorption cross sections will also be presented in order to show the little importance of the photolysis route in the degradation of *E/Z*-CHF=CHCF<sub>3</sub>. FTIR spectra, recorded in this work as well, has been used to estimate the Global Warming Potential (GWP) of these compounds. We will show how this corroborates the negligible contribution of these compounds to greenhouse effect.

## References

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