

HFC-23

Molecular Formula: CHF₃
 CAS RN: 75-46-7
 Molecular Weight: 70.01

Global Atmospheric Lifetime (years): 7.77 (228)
 Tropospheric Atmospheric Lifetime (years): 8.07 (243)
 Stratospheric Atmospheric Lifetime (years): 190.6 (4420)

	<i>Well-mixed</i>	<i>Lifetime and Stratosphere adjusted</i>
Radiative Efficiency (RE):	0.195	0.202 (0.18)

Global Warming Potential (GWP _H):	
GWP ₂₀	4699 (11085)
GWP ₁₀₀	1384 (12690)

Global Temperature Change Potentials (GTP _H):	
GTP ₂₀	3182 (11825)
GTP ₅₀	399 (13340)
GTP ₁₀₀	195 (13150)

* RE units: W m² ppb⁻¹
 * GWP and GTP: Relative to CO₂
 * Italic values in () taken from WMO-2018

Atmospheric Loss Processes *****

OH Reactivity (cm³ molecule⁻¹ s⁻¹)

$k_{\text{SAR}}(298 \text{ K}) = 6.81 \times 10^{-15}$	$k_{\text{Rec}}(T) = 6.1 \times 10^{-13} \exp(-2260/T)$
$k_{\text{SAR}}(272 \text{ K}) \approx 4.64 \times 10^{-15}$	$k_{\text{Rec}}(298 \text{ K}) = 3.1 \times 10^{-16}$
	$k_{\text{Rec}}(272 \text{ K}) = 1.5 \times 10^{-16}$
$\tau_{\text{Global}}^{\text{OH}} = 7.79 \text{ years}$	
$\tau_{\text{Trop}}^{\text{OH}} = 8.07 \text{ years}$	
$\tau_{\text{Strat}}^{\text{OH}} = 221.4 \text{ years}$	

O(¹D) Reactivity (cm³ molecule⁻¹ s⁻¹)

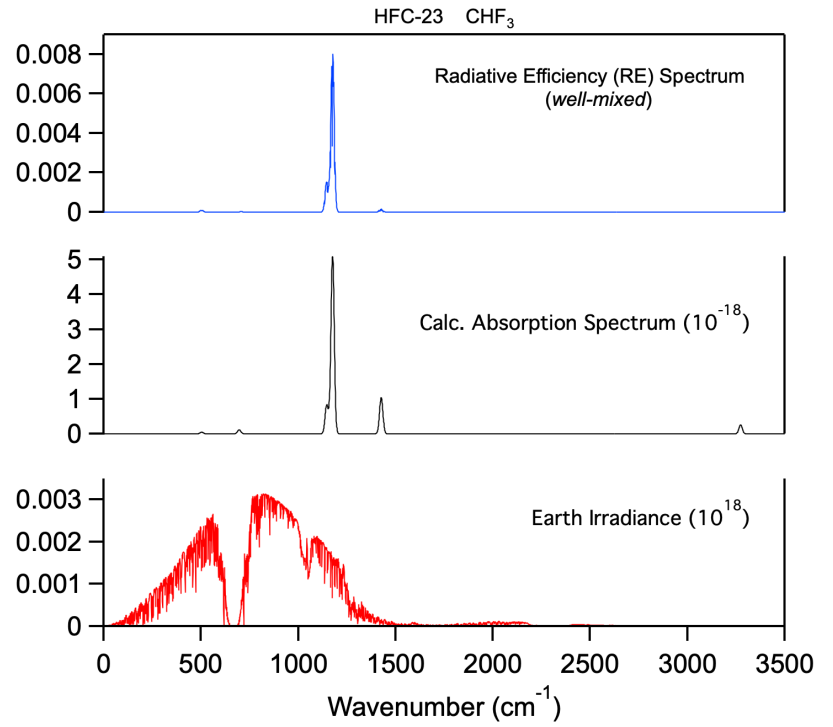
$k_{\text{Est}}(T) = 7.2 \times 10^{-12}$	$k_{\text{Rec}}(T) = 0.25 \times 8.7 \times 10^{-12} \exp(30/T)$
$\tau_{\text{O}(\text{1D})} = 1370 \text{ years}$	



Calculated Infrared Spectrum

Band Center (cm ⁻¹)	Band Strength (km mole ⁻¹)
503	2.9
503	2.9
696	14.6
1146	106.6
1176	326.5
1176	326.5
1426	67.1
1426	67.1
3273	33.4

Radiative Efficiency Spectrum



HFC-32

Molecular Formula: CH₂F₂
 CAS RN: 75-10-5
 Molecular Weight: 52.02

Global Atmospheric Lifetime (years): 7.23 (5.4)
 Tropospheric Atmospheric Lifetime (years): 7.54 (5.5)
 Stratospheric Atmospheric Lifetime (years): 173.4 (124)

	<i>Well-mixed</i>	<i>Lifetime and Stratosphere adjusted</i>
Radiative Efficiency (RE):	0.130	0.135 (0.11)

Global Warming Potential (GWP _H):	
GWP ₂₀	3963 (2530)
GWP ₁₀₀	1151 (705)

Global Temperature Change Potentials (GTP _H):	
GTP ₂₀	2599 (1440)
GTP ₅₀	309 (154)
GTP ₁₀₀	161 (98)

* RE units: W m² ppb⁻¹
 * GWP and GTP: Relative to CO₂
 * Italic values in () taken from WMO-2018

Atmospheric Loss Processes *****

OH Reactivity (cm³ molecule⁻¹ s⁻¹)

$$k_{\text{SAR}}(298 \text{ K}) = 7.26 \times 10^{-15}$$

$$k_{\text{SAR}}(272 \text{ K}) \approx 4.96 \times 10^{-15}$$

$$\tau_{\text{Global}}^{\text{OH}} = 7.28 \text{ years}$$

$$\tau_{\text{Trop}}^{\text{OH}} = 7.54 \text{ years}$$

$$\tau_{\text{Strat}}^{\text{OH}} = 208.3 \text{ years}$$

$$k_{\text{Rec}}(T) = 1.7 \times 10^{-12} \exp(-1500/T)$$

$$k_{\text{Rec}}(298 \text{ K}) = 1.1 \times 10^{-14}$$

$$k_{\text{Rec}}(272 \text{ K}) = 6.85 \times 10^{-15}$$

O(¹D) Reactivity (cm³ molecule⁻¹ s⁻¹)

$$k_{\text{Est}}(T) = 3.6 \times 10^{-11}$$

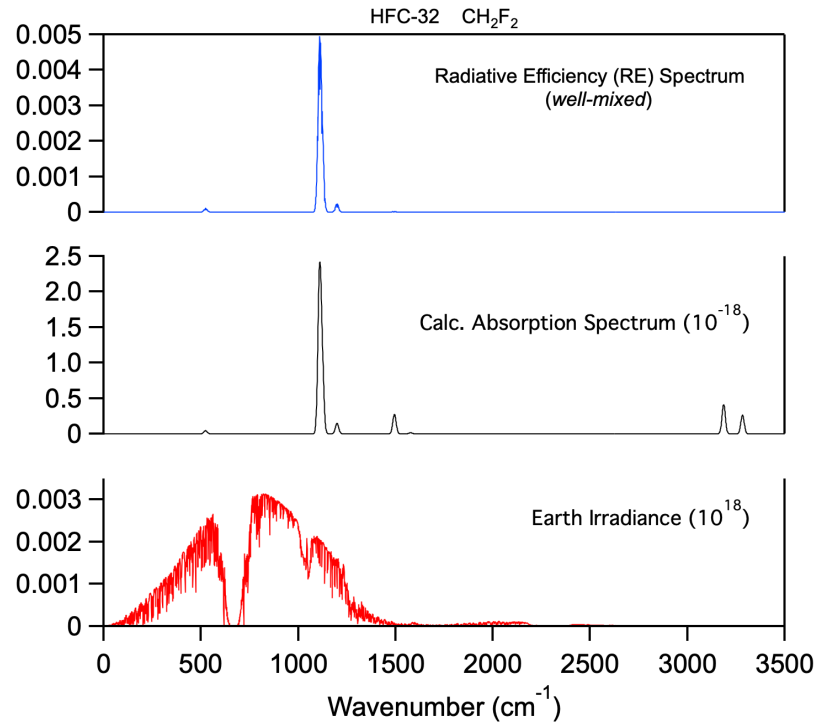
$$\tau_{\text{O}(\text{1D})} = 1036 \text{ years}$$

$$k_{\text{Rec}}(T) = 0.30 \times 5.1 \times 10^{-11}$$

Calculated Infrared Spectrum

Band Center (cm ⁻¹)	Band Strength (km mole ⁻¹)
523	5.6
1109	278.1
1123	109.4
1199	18.8
1295	0
1494	35.1
1577	1.9
3186	52.8
3283	33.9

Radiative Efficiency Spectrum



HFC-41

Molecular Formula: CH₃F
 CAS RN: 593-53-3
 Molecular Weight: 34.03

Global Atmospheric Lifetime (years): 2.85 (2.8)
 Tropospheric Atmospheric Lifetime (years): 2.95 (2.9)
 Stratospheric Atmospheric Lifetime (years): 83.9 (65)

	<i>Well-mixed</i>	<i>Lifetime and Stratosphere adjusted</i>
Radiative Efficiency (RE):	0.0358	0.0346 (0.02)

Global Warming Potential (GWP _H):	
GWP ₂₀	655 (430)
GWP ₁₀₀	178 (116)

Global Temperature Change Potentials (GTP _H):	
GTP ₂₀	272 (177)
GTP ₅₀	33 (21)
GTP ₁₀₀	25 (16)

* RE units: W m² ppb⁻¹
 * GWP and GTP: Relative to CO₂
 * Italic values in () taken from WMO-2018

Atmospheric Loss Processes *****

OH Reactivity (cm³ molecule⁻¹ s⁻¹)

$k_{\text{SAR}}(298 \text{ K}) = 1.77 \times 10^{-14}$	$k_{\text{Rec}}(T) = 2.2 \times 10^{-12} \exp(-1400/T)$
$k_{\text{SAR}}(272 \text{ K}) \approx 1.27 \times 10^{-14}$	$k_{\text{Rec}}(298 \text{ K}) = 2.0 \times 10^{-14}$
	$k_{\text{Rec}}(272 \text{ K}) = 1.28 \times 10^{-14}$
$\tau_{\text{Global}}^{\text{OH}} = 2.86 \text{ years}$	
$\tau_{\text{Trop}}^{\text{OH}} = 2.95 \text{ years}$	
$\tau_{\text{Strat}}^{\text{OH}} = 89.4 \text{ years}$	

O(¹D) Reactivity (cm³ molecule⁻¹ s⁻¹)

$k_{\text{Est}}(T) = 2.7 \times 10^{-11}$	$k_{\text{Rec}}(T) = 0.82 \times 1.5 \times 10^{-10}$
$\tau_{\text{O}(\text{1D})} = 1370 \text{ years}$	



Calculated Infrared Spectrum

Band Center (cm ⁻¹)	Band Strength (km mole ⁻¹)
1069	117.2
1212	0.9
1213	0.9
1521	5.3
1537	3.3
1537	3.3
3136	41.5
3260	34.3
3261	34.4

Radiative Efficiency Spectrum

