

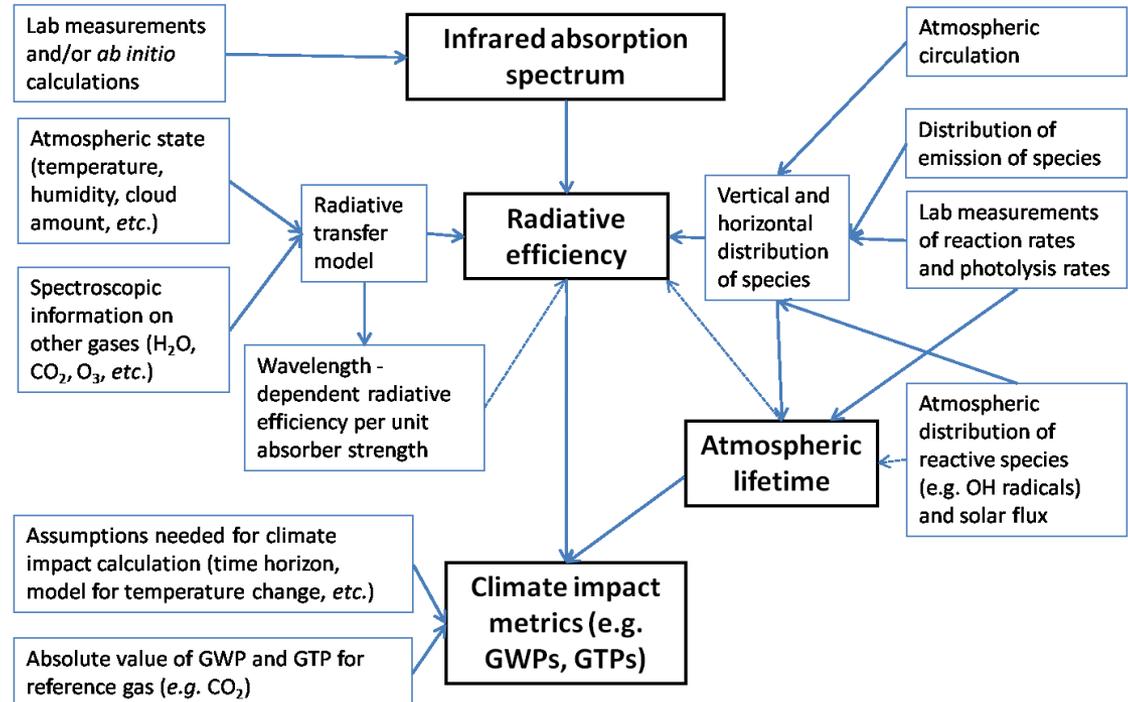
# Characterizing the importance of greenhouse gases

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- The importance of greenhouse gases on climate needs to be characterised – e.g. for the tabulations of the global warming potential that required by the Kyoto Protocol
- Therefore the characterisation of atmospheric concentrations and growth rates is only a first step
- Calculations of radiative effect need updating for “old” gases and initiating for “new” gases, and datasets need “homogenising” to ensure consistency



GLOBAL WARMING POTENTIALS AND RADIATIVE EFFICIENCIES OF HALOCARBONS AND RELATED COMPOUNDS: A COMPREHENSIVE REVIEW

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# An example ...

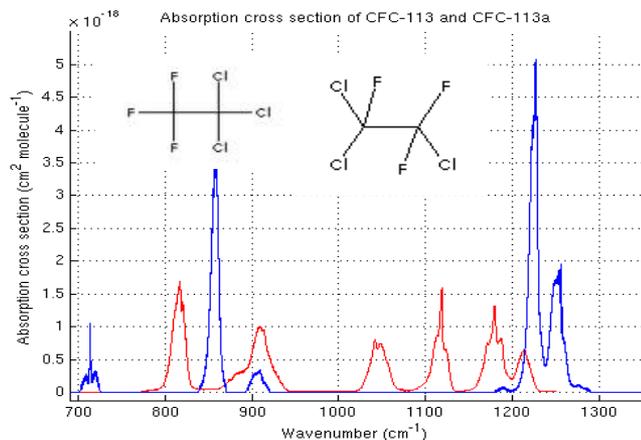
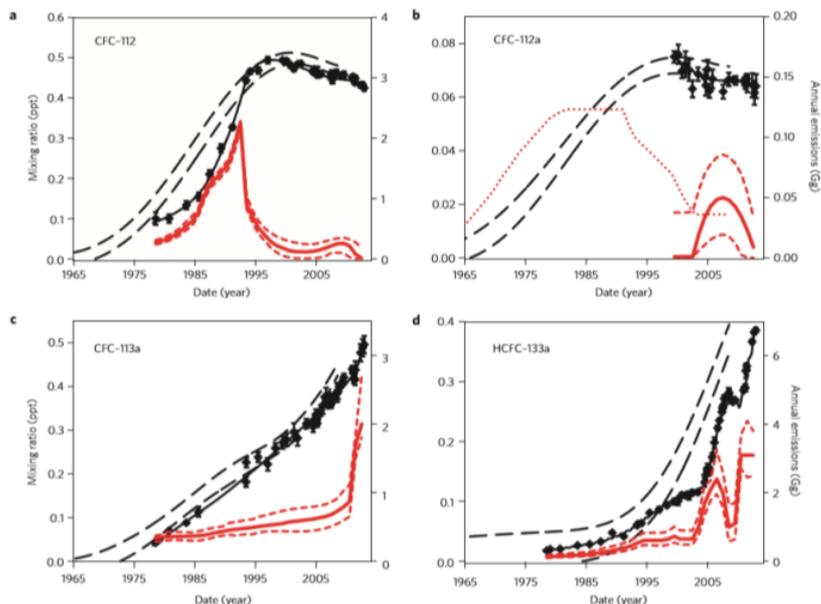
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## Newly detected ozone-depleting substances in the atmosphere

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**Table 1.** Radiative efficiencies, mixing ratios in late-2012, present-day radiative forcings, atmospheric lifetimes, GWPs (for time horizons of 20, 100 and 500 years) and the GTP for a time horizon of 50 years, for the 3 gases considered here.

Gas	Radiative Efficiency ( $\text{W}\cdot\text{m}^{-2}\cdot\text{ppbv}^{-1}$ )	Mixing Ratio (pptv)	Radiative Forcing ( $\text{W}\cdot\text{m}^{-2}$ )	Lifetime (years)	GWP (20)	GWP (100)	GWP (500)	GTP (50)
CFC-113a	0.23	0.48	$1.10 \times 10^{-4}$	51	4590	3310	1100	3920
CFC-112	0.29	0.44	$1.28 \times 10^{-4}$	51	5320	3840	1270	4540
HCFC-133a	0.15	0.37	$5.60 \times 10^{-5}$	4.3	1220	340	96	74

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Article

## Infrared Absorption Spectra, Radiative Efficiencies, and Global Warming Potentials of Newly-Detected Halogenated Compounds: CFC-113a, CFC-112 and HCFC-133a

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