

An overview of recent findings from halogenated trace gas observations in the troposphere and stratosphere

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Halogenated trace gases play a key role in the stratosphere, both through their impacts, e.g. as ozone-depleting substances and greenhouse gases or, in combination with tropospheric abundance trends, through their use as tracers of transport and/or chemistry. We here present a selection of recent results from air sample-based measurements of these gases in the troposphere and stratosphere with a highly sensitive and precise system based on gas chromatography and mass spectrometry. This system is capable of detecting more than 50 of these gases and we have analysed samples originating from a range of platforms spanning from ground level to 36 km. The presentation will include examples of i) globally relevant tropospheric long-term trends based on an air archive from the remote southern hemisphere, ii) distributions of gases in the upper troposphere and lower stratosphere (UT/LS) based on the CARIBIC aircraft project, iii) recent improvements in determining stratospheric trace gas lifetimes and semi-empirical Ozone Depletion Potentials (ODPs), and iv) new approaches to determining the mean age of air as a measure of the Brewer-Dobson circulation.

Key words: halogenated, observations, ODSs, mean-age