

## 2.086 Long-term observations of OH reactivity at the central European GAW station Hohenpeissenberg .

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Abstract:

The inverse of OH lifetime, i.e. the total OH loss rate also termed OH reactivity ( $s^{-1}$ ), is being measured continuously on a long-term basis at the Meteorological Observatory Hohenpeissenberg which is a global station in the WMO Global Atmosphere Watch (GAW) programme. This site is situated on a hill surrounded by meadows and forests in a rural part of central Europe where OH reactivity typically is below  $15 s^{-1}$ .

Here we present long-term direct OH reactivity measurements made by a chemical ionisation mass spectrometer (CIMS). A novel method for OH reactivity measurements for CIMS was devised in 2009 and the instrument, already operationally running for OH and sulfuric acid concentration measurements, was adapted to include OH reactivity as part of the continuous measurement cycle.

The direct OH reactivity measurements are compared with OH reactivity calculated from concurrently measured trace gases. These reactive trace gases include inorganic species such as CO, NO, NO<sub>2</sub>, SO<sub>2</sub> and about 80 organic species, including species with dominant single contributions to OH reactivity such e.g. methane, ethene, isoprene and acetaldehyde. OH reactivity changes, missing reactivity and their key drivers (such as dynamics, proximity to OH reactant sources etc.) are investigated over a range of timescales from diurnal, seasonal to annual. OH reactivity observations are also interpreted as part of a chemical climatology to demonstrate the potential use of these long-term measurements.