

## **Long-term stability measurements of low concentration Volatile Organic Compound gas mixtures**

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VOCs (Volatile Organic Compounds) are a class of compounds with significant influence on the atmosphere due to their large anthropogenic and biogenic emission sources. VOC emissions have a significant impact on the atmospheric hydroxyl budget and nitrogen reservoir species, while also contributing indirectly to the production of tropospheric ozone and secondary organic aerosol. However, the global budget of many of these species are poorly constrained. Moreover, the World Meteorological Organization's (WMO) Global Atmosphere Watch (GAW) have set challenging data quality objectives for atmospheric monitoring programmes for these classes of traceable VOCs, despite the lack of available stable gas standards.

The Key-VOCs Joint Research Project is an ongoing three-year collaboration with the aim of improving the measurement infrastructure of important atmospheric VOCs by providing traceable and comparable reference gas standards and by validating new measurement systems in support of the air monitoring networks. It focuses on VOC compounds that are regulated by European legislation, that are relevant for indoor air monitoring and for air quality and climate monitoring programmes like the VOC programme established by the WMO GAW and the European Monitoring and Evaluation Programme (EMEP). These VOCs include formaldehyde, oxy[genated]-VOCs (acetone, ethanol and methanol) and terpenes ( $\alpha$ -pinene, 1,8-cineole,  $\delta$ -3-carene and R-limonene).

Here we present the results of a novel long term stability study for low concentration formaldehyde, oxy-VOC and terpenes gas mixtures produced by the Key-VOCs consortium with discussion regarding the implementation of improved preparation techniques and the use of novel cylinder passivation chemistries to guarantee mixture stability.