

RO₂ Intercomparison Campaign at SAPHIR Chamber

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RO₂ radicals are involved in the oxidation processes in the gas phase, generating secondary products impacting the air quality and human health. Understanding these oxidation processes through the quantification of these radicals is still challenging because their concentrations are low and quickly variable. There are only few instruments worldwide allowing to perform such measurements, among them, the newly implemented UL (University of Lille)-FAGE instrument (Fluorescence Assay by Gas Expansion).

Two complementary measurements allow to access to RO₂ concentration:

- One using our HO₂ cell, where HO₂ radicals are indirectly measured after its conversion into OH by injecting NO at the entrance of the detection cell. At high NO conversion concentration, we can get the HO₂* (sum of HO₂ + β-alkylperoxy) [Fuchs, 2011]
- One using a RO_x-conversion tube on top of a FAGE cell. It is based on the two-step chemical conversion of the RO₂ radicals into HO₂ in a conversion reactor placed at the top of a FAGE cell and LIF (Laser Induced Fluorescence) for OH detection at low pressure [Fuchs, 2008].

During this summer an RO₂ intercomparison campaign took place at the SAPHIR chamber (Jülich, Germany). Nine groups using different instruments participated in this campaign. The performance of the UL-FAGE instruments for the RO₂ measurement under wide range of atmospherically relevant chemical conditions (e.g. water vapor, nitrogen oxide, various organic compound, day and night chemistry) during this campaign will be discussed.

References:

H.Fuchs et al., (2008), *Review of Scientific Instruments* 79, 084104.

H.Fuchs et al., (2011), *Atmospheric Measurement Techniques* 1209–1225