Milestone 3.10. Released Measurement Guideline for VOCs and NOx.

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Summary

The updated Measurement Guideline for NO_x and VOCs (deliverable 3.17 of ACTRIS-2) is based on the original measurement guidelines for VOCs and NO_x, which were produced within the first ACTRIS project (Deliverable D4.9: Final SOPs for VOCs measurements and Deliverable D4.10: SOPs for NO_{xy} measurements). This updated measurement guideline provides recommendations for good measurement practice for the analysis of NO_x and VOCs under ACTRIS. The deliverable is separated in part 1 on NO_x and part 2 on VOCs.

Atmospheric volatile organic compounds (VOCs) and nitrogen oxides (NO_x) play an important role in the formation of secondary air pollutants such as ozone, secondary organic aerosols and short-lived climate forcers. Therefore, their continuous measurements contributes to the verification of emissions control measures and are valuable input variables for chemical models to forecast air pollution and the oxidative capacity of the atmosphere.

VOCs consist of low-boiling non-methane hydrocarbons (alkanes, alkenes, alkynes, aromatics, terpenes) and oxygenated hydrocarbons (alcohols, ketones, aldehydes). VOCs with lifetimes from minutes to months are emitted by both the biosphere and by anthropogenic activities, such as motor vehicle exhaust and solvent usage.

Priority VOCs to be measured within in-situ measurement systems have been identified in the GAW Report No. 171 and are the main focus of this measurement guideline (MG). In respect to the quality assurance the MG provides an update of the WMO report and will also build the basis of a future WMO guideline which is in progress, with members of the ACTRIS VOC community being among the drivers of this global effort.

NO_x consists of NO and NO_2. Whereas NO is emitted from the burning of fossil fuel, NO_2 is mainly formed in the atmosphere as secondary product from the photochemical destruction of VOCs.

Measurements of nitrogen oxides (NO_x) have been made for decades using a number of different techniques and calibration scales. This MG was created by the ACTRIS community with the objective to document the measurement techniques in use and to contribute to a convergence of these techniques in Europe to establish a harmonized European data set of atmospheric nitrogen oxides observations. This MG follows up the initial work on this topic in the GAW Report #195 and will build the basis for a future measurement guideline planned to be produced under the auspices of WMO.

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