
Use of portable, low-cost and easy to use OSH to detect and monitor environmental pollutants in air and water

Hosting institution: University of Zagreb, Faculty of Geotechnical Engineering

Minimum duration: 5 days and max. 1 month per each STSM

The STSM will give the applicant the possibility to measure the specific pollutants in air and /or water using OSH, which includes the following:

1. In-situ analysis or continuous monitoring of pollutant concentration during the photocatalytic treatment of polluted water and/or air samples (**2 STSM possible**)
2. Field tests for detection of emerging pollutants in aquatic environment of concern (**1 STSM**)
3. Application of OSH for monitoring emission: landfill, urban and industrial areas, ammonia and pesticides from agricultural sources (**2 STSM**)

The results obtained using OSH will be compared to the results obtained by the common analytical techniques (spectrophotometry, FT-IR and other gas analysis, etc.), providing the sufficient information for data analysis and validation.

Key Research Facilities, Infrastructure and Equipment:

Advanced experimental systems for photocatalytic processes on small and large scale are available at hosting institution (Laboratory for Environmental Engineering, Process Engineering Unit). Pilot-scale photocatalytic reactors include: (1) the FPCR (flat-plate cascade reactor) designed to simulate the water flow directed from the water-body (e.g. river) to a horizontal open surface. The solar and UV intensities at horizontal plate can be set to different times of a year at various locations throughout the globe using the solar simulator; controlled simulated irradiation allows experimental studies under various intensities of incident irradiation and various portion of UVA and UVB irradiation in respect to overall light intensity. Second is (2) the CPC (compound parabolic collector) reactor which is reported as the optimal configuration of pilot-scale photocatalytic reactor. Our CPC system can be tested under simulated solar irradiation indoor and outdoor as well. It can be used for both water and air treatment.

Additionally, at our premises there are experimental systems for landfill simulation, biological, mechanical and thermal waste treatment.

Available instrumentation: HPLC systems, TOC analyser, AAS spectrometer, variety of spectrophotometers, portable instruments for measuring air and water quality; Geotech GA5000 landfill gas analyser; with an access to: GC-MS and LC/MS QTOF system, FT-IR, Raman, SEM/TGA, HRTEM.

Requirements: These STSMs are intended for the applicants who would like to try their own OSH in real environment, compare the data and validate their own techniques.