**NORMAN Collaborative Trial**

**Non-target and suspect screening methods for**

**organic substances in indoor dust**

**Background**

This Collaborative Trial is organised by the NORMAN Association ([www.norman-network.net](http://www.norman-network.net)) as part of its Joint Programme of Activities for the year 2015. The activity is a follow-up action to the discussion in the NORMANGeneral Assembly and ameeting of the Working Group on Emerging Substances in the Indoor Environment in Amsterdam (2014), where one of the recommendations was to organize a collaborative trial on **non-target and suspect screening methods *for organic substances in indoor dust*** in Europe.

The scientific and technical preparation of the exercise, the collection and evaluation of the results, the preparation of the evaluation report, and the dissemination of results will be taken care of by NILU - Norwegian Institute for Air Research, Norway, and the Environmental Institute, Slovak Republic, in close cooperation with Technical University of Munich, Germany; UMEA University, Sweden; University of Antwerpen, Belgium; IVL, Sweden; IVM, Netherlands; and RECETOX, Czech Republic.

This Collaborative Trial is carried out in synergy with the ongoing “Inter-laboratory study on “novel” halogenated flame retardants in household indoor dust” (INTERFLAB phase 2) organized by Melymuk and Diamond. Aliquots of the same dust sample will be used in the current exercise.

**Objectives**

The main objective of the exercise is to draft a recommendation by the NORMAN Association on the use of **non-target and suspects screening for** **the identification of organic contaminants in dust from residential indoor environments**.

This recommendation will be based on in-depth discussion of the outcomes of the trial at a planned workshop in 2016.

Specific objectives of the Collaborative Trial are analysis of the dust sample using MS techniques established in each of the participating laboratories and declaration of:

1. **How many substances are present in the sample;**
2. **How many of them can be provisionally identified by suspect and non-target screening;**
3. **Which compounds are identified;**
4. **What are the semi-quantitative amounts of the identified compounds.**

The Collaborative Trial should provide in-depth information on the methodologies used by participating laboratories. It will be carried out for the first time in the area of the indoor environment analysis worldwide and therefore the results should be presented in a common publication in a prestigious refereed journal.

**Set up**

The Collaborative Trial will be carried out with a sample of household dust using recommended extraction techniques (dichloromethane for GC-MS analysis and 10% dichloromethane in methanol for LC-MS analysis), in-house clean-up methods, and the liquid chromatography-high resolution-mass spectrometry (**LC-HR-MS**) and/or gas chromatography-mass spectrometry (**GC-MS**) methodologies available in participating laboratories.

The sample has been collected from Canadian households (in synergy with the INTERFLAB sample) using vacuum cleaner. The collected sample consists of bulked homogenized dust that has been pre-treated with a coarse stainless steel sieve (1 mm). One fraction of the dust sample has been used in the INTERFLAB study while the other fraction will be used in this NORMAN collaborative trial.

Based on the results from the INTERFLAB phase 2, a list of detected substances in the dust will be provided to the participants so that the non-target participants can start based on the same knowledge. Information on concentration ranges will also be provided from the kind contribution from INTERFLAB phase 2.

An evaluation workshop will be organised in 2016[[1]](#footnote-1) to provide in-depth discussions of the results with the participating laboratories and drafting of recommendations for further improvement actions.

**Samples**

Participants will receive:

**One/two aliquot(s)** (100-200 mg) of the bulked homogenized dust sample sieved to <1 mm size.

**A standard mixture** of compounds **for calculation of retention time index** will be provided by the Technical University of Munich and distributed together with the dust aliquot to all participating laboratories using LC-HR-MS. The mixture should be injected into the analytical system with the same conditions as used for analysis of the dust sample and the compounds should be identified and their retention times recorded. Other retention time prediction methods can be used in parallel.

**A standard mixture** of substances **for calculation of retention indices** will be provided by the Environmental Institute, Slovak Republic together with the dust aliquot for all laboratories using GC-MS systems. The mixture must be injected into the analytical system with the same conditions as used for analysis of the dust sample and the retention times should be recorded.

The distribution of the dust aliquot and standard mixtureswill be organised by the Environmental Institute, Slovak Republic.

An Excel reporting template, based on the template used in the previous NORMAN non-target Collaborative Trial for water, will be provided to all participants.

**Timing**

The dust aliquot with accompanying standard mixtures will be distributed to the participating laboratories by the end of **November 2015.**

**The deadline for submitting the final results is April 1st 2016!!**

**Reporting of results**

Results from each participant shall be registered in an Excel reporting template distributed to all participants and submitted electronically by **April 1st, 2016** to **Ildiko Ipolyi** at Environmental Institute ([ipolyi@ei.sk](mailto:ipolyi@ei.sk)).

**Summary of time schedule**

**30 October 2015**: Deadline for registration in the Collaborative Trial

**30 November 2015**: Distribution of dust sample and standards to participants

**1 April 2016**: Deadline for submission of the results by the participants

**1 October 2016**: Reporting and distribution of draft report to the participants

**2016** (date and venue to be confirmed): Discussion of the results in the Non-target screening workshop

**Participation and registration**

If you wish to participate, please **register on:**

[**http://www.nilu.no/norman**](http://www.nilu.no/norman)

before **30 October 2015**.

**Participants**

Any laboratory equipped with LC-HR-MS and/or GC-MS instruments for analysis of unknown organic pollutants is invited to participate in this Collaborative Trial. Participants will preferably be members of the NORMAN Association. However, participation of external laboratories is very much welcome.

Explicitly, any laboratory performing non-target screening in Europe and other countries is invited to participate. Participants are automatically welcome to join the follow-up workshop.

A preliminary list of potentially interested laboratories:

ACES, Stockholm University, Sweden

BfG - Federal Institute of Hydrology, Germany

BRGM, France

Eawag, Switzerland

Environmental Institute, Slovak Republic

IAREN, Water Institute of Northern Region, Portugal

INERIS, National Institute for Environmental Technology and Hazards, France

IRSTEA, Nat. Research Inst. of Science & Tech. for Envir. and Agricult, France

ISSeP, Institut Scientifique de Service Public, Belgium

IVL, Swedish Environmental Research Institute, Sweden

IVM, The Netherlands

IUPA, Research Institute for Pesticides and water - University Jaume I, Spain

LPTC, Groupe de Physico-Chimie de l'environnement, Université Bordeaux 1, France

NIVA, Norwegian Institute for Water Research, Norway

NILU, Norwegian Institute for Air Research, Norway

OMEGAM Laboratoria, The Netherlands

Ontario Ministry of the Environment, Applied Chromatography Sect., Canada

RECETOX, Czech Republic

Technical University of Munich, Germany

TGM, T. G. Masaryk Water Research Institute, Czech Republic

UFZ, Germany

UMEA University, Sweden

University of Antwerpen, Belgium

University of Birmingham, United Kingdom

UoA, National and Kapodistrian University of Athens, Greece

VEOLIA Environment, France

1. The date and venue of the workshop will be confirmed during the course of the exercise. [↑](#footnote-ref-1)