5th WEPAL-Quasimeme Laboratory Performance Study for Passive Sampling in Water

This is to invite you to participate in the 2021 WEPAL-Quasimeme laboratory performance study (LPS) for passive sampling of organic compounds in water.

We aim to include three sampler/compound combinations.

1. nonpolar compounds in silicone samplers
2. nonpolar compounds in low-density polyethylene (LDPE) samplers
3. polar compounds in POCIS-HLB

Participants can subscribe to one or more sampler/compound combinations. Details are given in section *Sampler/compound combinations* below.

This study can proceed for each compound/sampler combination if at least 15 participants subscribe, to ensure sufficient power for statistical analysis and to keep cost within limits.

One of the previous sampling locations

Organizers

This study is organized by WEPAL-Quasimeme, with support from Bran Vrana and Foppe Smedes (both RECETOX) and Kees Booij (PaSOC).

WEPAL-Quasimeme is a not for profit organization associated with Wageningen University (NL)

RECETOX is an academic research institution associated with Masaryk University (CZ)

Kees Booij is self-employed scientist under company name PaSOC.

Exposure frames for silicone sheets

Benefit of participating

Analytical error has been identified as a major source of passive sampling uncertainty, both for nonpolar compounds and for polar compounds (https://doi.org/10.1002/etc.3657 and https://dx.doi.org/10.1016/j.trac.2015.10.013). Participants can compare their performance to others, and can demonstrate quality of their analytical methods to funding agencies and customers. Participation is strictly anonymous through the use of lab codes. Participating laboratories only know their own lab code and are free to communicate this code to the outside world or not.

We expect that results for polar compounds in POCIS-HLB and a comparison of results for silicone and LDPE have enough substance to be published in a scientific journal. If so, laboratories will be invited to co-author a joint publication.

Sampler/compound combinations

1. Nonpolar compounds in silicone samplers

The LPS for silicone samplers has been organized four times earlier, and is likely to attract a sufficient number of participants.

Sampler material is SSP-M823 silicone with thickness 250 um.

Determinands are PCBs, non-alkylated PAHs, PBDEs, 4,4'-DDT, 4,4'-DDE, hexachlorobutadiene, hexachlorobenzene, and retained fractions of performance reference compounds (PRCs). See section *Target compounds* and tables at the bottom.

Participants will receive exposed and non-exposed samplers. Two vials with PRCs are also provided to support participants in identification of these PRCs in the chemical analysis.

Participants are further asked to report aqueous concentrations of a few selected compounds, using on their own calculation method.

2. Nonpolar compounds in LDPE samplers

Number of participants for LDPE samplers was almost sufficient in 2018 (11, but 15 needed). We therefore want to give the LPS for LDPE another try.

Further study details are the same as listed for silicone samplers above.

3. Polar compounds in POCIS-HLB

HLB sorbent is chosen because it captures a wide range of polar organic compounds. Granular sorbent is chosen because sample homogenization is more convenient with granular HLB than with extraction disks (Chemcatcher) or binding gels (o-DGT). Determinands cover a range of commonly analyzed compounds. See section *Target compounds* and tables at the bottom.

Target compounds

Selection of target compounds/determinands (see tables below) is based on previous experience (this LPS and the 2011 NORMAN Interlaboratory Study). Participants are encouraged to report results for as many compounds as possible, but reporting results for all compounds is not mandatory.

Participants can suggest additional compounds. These will be included if a sufficient number of results can be expected.

Sample shipment vials

Cost

The LPS is organized on a cost-neutral basis without external funding.

Participation cost is as follows

one sampler/compound combination (e.g., only nonpolar compounds in silicone): EUR 880

two sampler/compound combinations (e.g., nonpolar compounds in LDPE and polar compounds in POCIS-HLB): EUR 1480

three sampler/compound combinations: EUR 1880

How to subscribe

Send an e-mail to quasimeme@wur.nl before 11 JUN 2021, with CC to keesbooij@pasoc.eu

Specify if you wish to participate for silicone samplers, LDPE samplers, and/or POCIS-HLB.

Specify sample delivery address, contact person, and invoice address.

EU participants: specify your VAT number.

Intended time schedule

11 JUN 2021: Participant subscription received by Quasimeme

14 JUN 2021: WEPAL-QUASIMEME informs subscribing laboratories if the LPS for their preferred sampler/compound combination can proceed.

1 NOV 2021: sample dispatch to participants

28 FEB 2022: data submission deadline

30 APR 2022: report ready

Further information

Contact keesbooij@pasoc.eu if you need further information on this study.

Determinands for LDPE and silicone samplers

Native compounds	reporting unit
hexachlorobutadiene	ng/g
hexachlorobenzene	ng/g
4,4'-DDE	ng/g
4,4'-DDT	ng/g
PCB 28	ng/g
PCB 52	ng/g
PCB 101	ng/g
PCB 118	ng/g
PCB 138	ng/g
PCB 153	ng/g
PCB 180	ng/g
acenaphthene	ng/g
acenaphthylene	ng/g
fluorene	ng/g
phenanthrene	ng/g
anthracene	ng/g
fluoranthene	ng/g
pyrene	ng/g
benzo[a]anthracene	ng/g
chrysene	ng/g
chrysene + triphenylene	ng/g
benzo[b]fluoranthene	ng/g
benzo[k]fluoranthene	ng/g
benzo[b]+[j] fluoranthene	ng/g
benzo[b]+ [k] fluoranthene	ng/g
benzo[b]+[j]+[k] fluoranthene	ng/g
benzo[a]pyrene	ng/g
benzo[ghi]perylene	ng/g
indeno[1,2,3-cd]pyrene	ng/g
dibenzo[a,h]anthracene	ng/g
BDE 28	ng/g
BDE 47	ng/g
BDE 99	ng/g
BDE 100	ng/g
BDE 153	ng/g
BDE 154	ng/g

Performance Reference Compounds	
PCB 1	fraction relative to control sampler
PCB 2	fraction relative to control sampler
PCB 3	fraction relative to control sampler
PCB 10	fraction relative to control sampler
PCB 14	fraction relative to control sampler
PCB 21	fraction relative to control sampler
PCB 50	fraction relative to control sampler
PCB 55	fraction relative to control sampler
PCB 78	fraction relative to control sampler
PCB 104	fraction relative to control sampler
PCB 145	fraction relative to control sampler
PCB 204	fraction relative to control sampler

Determinands for POCIS-HLB

Compound	reporting unit
Atenolol	ng/g
Metoprolol	ng/g
Carbamazepine	ng/g
Diclofenac	ng/g
Ibuprofen	ng/g
Sulfamethoxazole	ng/g
Atrazine	ng/g
Diuron	ng/g
Terbutylazine	ng/g
Terbutryn	ng/g
Carbendazim	ng/g
PFOA	ng/g
PFOS	ng/g
Imidacloprid	ng/g
Thiacloprid	ng/g