Passive sampling of emerging pollutants: state of the art and perspectives

NORMAN expert group meeting

Prague, 27th May 2009

Opening remarks

Branislav Vrana

Water Research Institute, Slovakia

branovrana@gmail.com

Tomáš Ocelka

Institute of Public Health Ostrava, Czech Republic

Chairman of the IPSW organising commitee

tomas.ocelka@zuova.cz

Jaroslav Slobodník

Environmental Institute, Slovakia

Chairman of the NORMAN association

slobodnik@ei.sk

NORMAN network

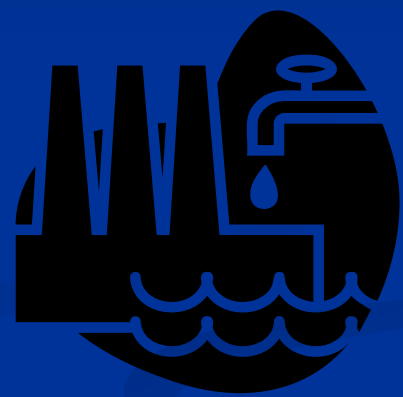
- Non-profit association of all interested stakeholders dealing with emerging substances
- A self sustainable permanent network
- Members:
  - Competent authorities / Reference laboratories: i.e. institutes/organisations designated by the competent authorities at the national level to offer technical and scientific support in specific fields related to environmental protection
  - Research centres and academia
  - Industry stakeholders
  - Government institutions and standardisation bodies.

Role of NORMAN

- Identify substances of high priority
- Provide QA tools
- Check availability of methods and status of their validation
- Bring together experts, PT providers or other bodies for rapid organisation of studies for method validation
- Guidance on method validation at various levels according to the needs of customers

Emerging environmental substances

- 300 million tons of synthetic compounds annually used in industrial and consumer products partially find their way into natural waters
- 140 million tons of fertilizers and several million tons of pesticides are applied each year
- In the EU), more than 100,000 registered chemicals, of which 30,000 to 70,000 are in daily use



Emerging environmental substances

- Substances not included in routine monitoring programmes
- Present in the environment
- Candidates for future regulation
  - fate, behaviour and (eco)toxicological effects are not well understood
  - research on occurrence/persistence/effects

Emerging substances

- Algal toxins
- Antifoaming agents
- Antioxidants
- Antifouling compounds
- Bio-terrorism/ sabotage agents
- Complexing agents
- Detergents
- Disinfection by-products (drinking water)
- Plasticizers
- Flame retardants
- Fragrances
- Gasoline additives
- Industrial chemicals
- Nanoparticles
- Perfluoroalkylated substances and their transformation products
- Personal care products
- Pesticides
- Biocides
- Pharmaceuticals
- Trace metals and their compounds
- Anticorrosives
- Wood preservatives
- Other

norman

IPSW 2009 Prague

Passive sampling

- Emerging strategy in the design of monitoring programmes and ecotoxicological assessments
- Great potential in:
  - Identification of emerging pollutants (e.g. in combination with bioassays-directed chemical analysis)
  - Assessment of bioavalability and bioaccumulation
  - in situ measurement of time-weighted average concentrations over extended periods

Passive sampling



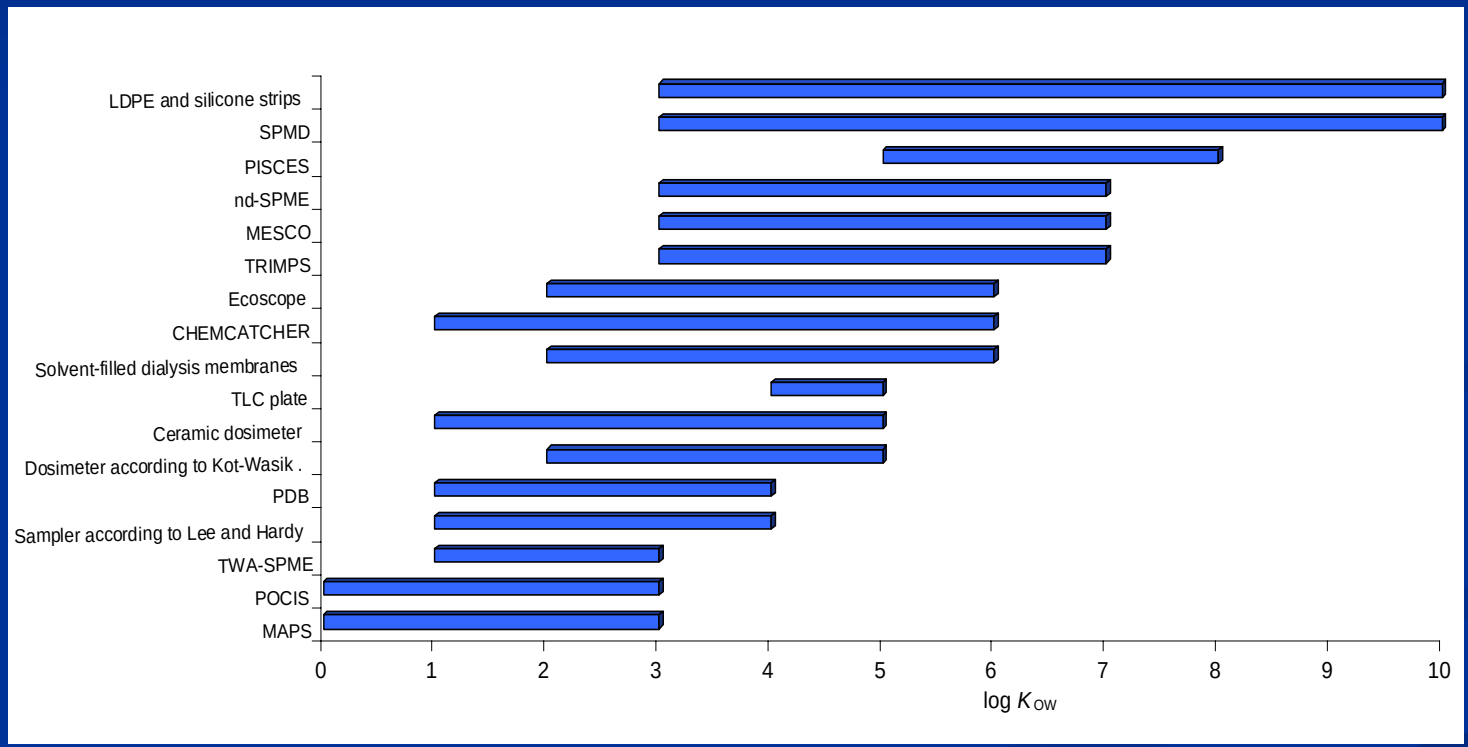




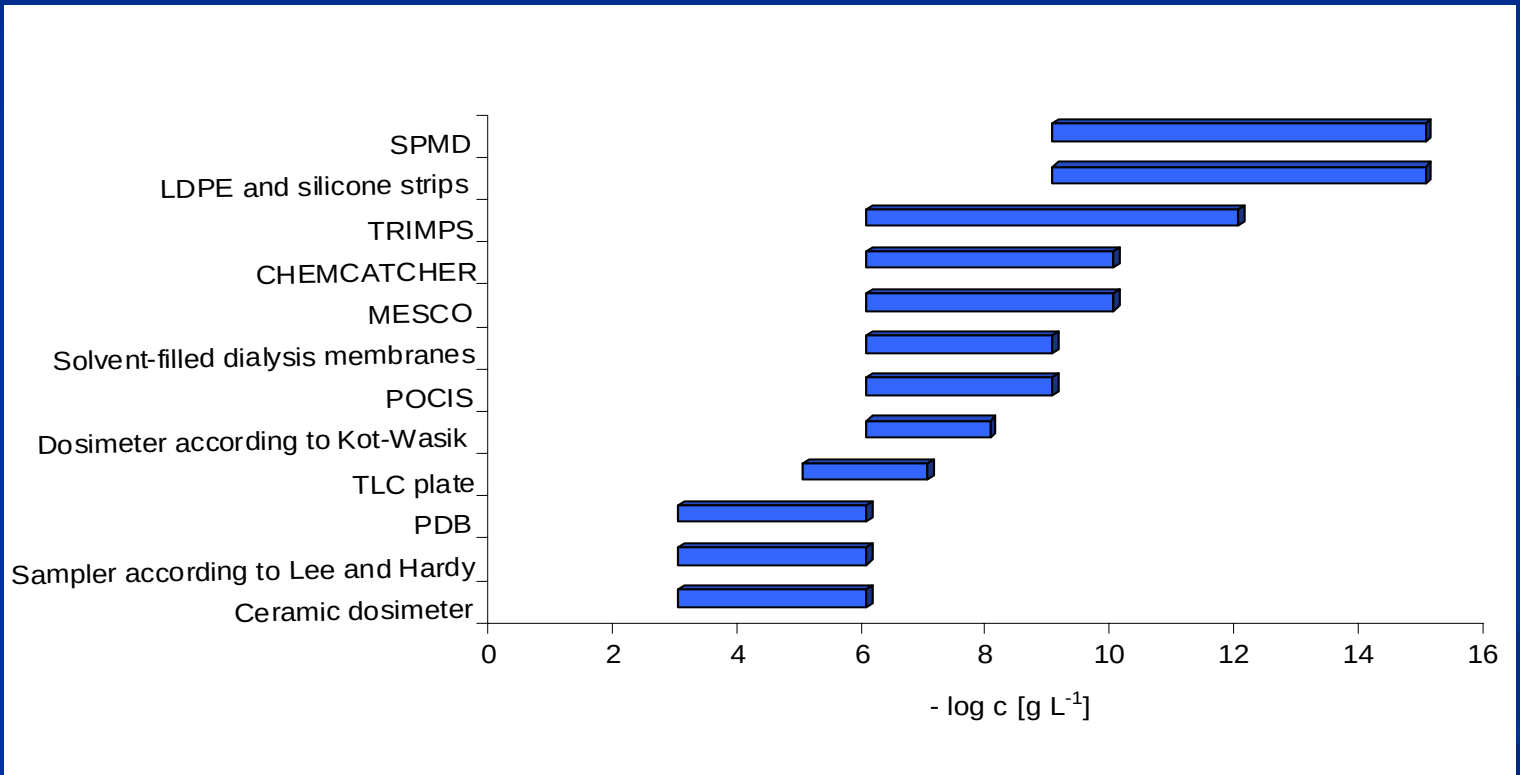

norman

IPSW 2009 Prague

Hydrophobicity range of compounds sampled by passive sampling devices



Detectable concentrations of compounds by selected passive sampling devices



Expert group meeting

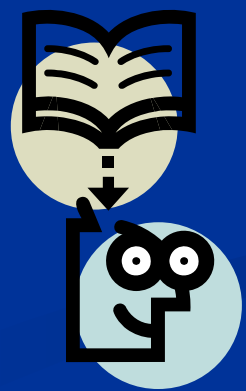
- Focused on monitoring of emerging substances in water using passive sampling techniques
- Aim of the meeting:
  - review the state of the art of the technology
  - harmonise the work in the area of passive sampling
  - plan the development of sound validation procedures for:
    - laboratory calibration
    - handling
    - field deployment
    - chemical analysis or toxicological analysis
    - data interpretation.

Issues addressed

- capabilities and limitations of the various passive samplers in relation to environmental conditions, ease of operation, cost, detection limits, and quality assurance and quality control
- identification of emerging pollutants using PS coupled with ecotoxicity testing/chemical analysis
- quantification of pollutants, and the translation of laboratory calibrations to field deployments
- techniques and materials applicable for sampling "difficult" compounds e.g. labile compounds, surfactants, groups of compounds with a specific toxicological mode of action
- Utility and validity of the passive sampling technologies and methodologies within a regulatory context
- Consensus approach to the normation of passive sampling technology
- agreement on an interlaboratory calibration study

Expert group mission

The Expert Group meeting will deliver a **position paper** summarising the position of the NORMAN experts on the topic of passive sampling (dissemination via the web).



Meeting audience

- 33 invited participants from 16 countries Australia, Canada, Europe, USA
  - universities
  - environmental research institutes
  - governmental reference laboratories
  - governmental environment agencies
  - private companies in environmental quality monitoring
  - industry

Meeting programme

8:30-9:00	Registration
9:00 - 9:15	**Welcome and introduction to the expert group meeting objectives** *Branislav Vrana, Water Research Institute, Bratislava, Slovakia*
9:15 -9:45	**NORMAN - Network of reference laboratories and related organisations for monitoring and biomonitoring of emerging environmental pollutants** *Jaroslav Slobodnik, chairman of the NORMAN network, Environmental Institute, Slovakia*
9:45-10:30	**Combining passive sampling with bioassays and evaluating effects of flow on passive sampler performance under environmental conditions** *Etienne Vermeirssen, Eawag, Switzerland*
10:30 - 11:00	Coffee break
11:00-11:30	**Role of passive sampling in regulatory monitoring** *Ian Allan, NIVA, Norway*
11:30-12:00	**A novel approach to passive sampling - continuous flow-integrative passive sampler** *Ignacio Valor, Labaqua, Spain*
12:00-12:30	**Passive sampling and analysis of cyclic siloxanes** *Chris Sparham, Unilever, United Kingdom*
12:30-13:00	**Passive sampling of pharmaceuticals and other polar emerging pollutants** *Catherine Gonzalez, EMA, France and Anne Togola, BRGM, France*

norman

IPSW 2009 Prague

Meeting programme

13:00 -14:30	Lunch break
14:30-15:00	**Normation of passive sampling technology** *Richard Greenwood, University of Portsmouth, United Kingdom*
15:00 -15:30	**Discussion: Prioritisation of emerging pollutants - where to focus the future research?**
15:30 -16:00	**Discussion: Conversion of passive sampling data into concentrations in the sampled media**
16:00-16:30	Coffee break
16:30-17:30	**Discussion: An interlaboratory calibration study for 2010**
17:30	Closing of the workshop

Welcome to Prague!