



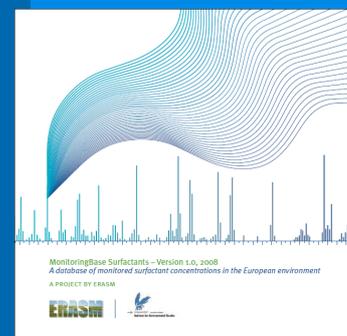
Development of "MonitoringBase-Surfactants: a (meta)database for measured concentrations of surfactants in environmental matrices in Europe

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Abstract

ERASM (www.erasm.org), with support of the Institute for Environmental Studies of the Free University of Amsterdam (IVM), has further developed the user-friendly CEFIC-LRI database "MonitoringBase" to store metadata and actual measurements from surfactants in the environment across Europe. This has enabled ERASM to create a legacy of its work, as well as to demonstrate leadership of the detergent industry by providing information to external stakeholders. MonitoringBase-Surfactants is implemented in Microsoft Access 2000, which enables all information to be managed from a single database file. The various types of monitoring programmes and measured concentration data were entered into separate tables for each specific data type. Reports of retrieved data were designed for export to Word documents, Excel worksheets or for printing directly.

A list of target substances was prepared in cooperation with ERASM to perform the search of information on measured concentration of surfactants in the environment. The list included the four surfactant groups: anionics, non-ionics, cationics and amphoteric. The time period covered is mainly from 1980–2008. The literature search was performed using the Web of Science and CAB databases. In addition, much data were received as reports or publications from industry or ERASM. The database (version 1.0, 2008) contains information from 36 studies, and over 2000 measured concentration data. The database will be made available free of charge via ERASM upon request (contact: aby@cefic.be).



MonitoringBase-Surfactants CD-box

Introduction

A considerable amount of resources has been spent by the detergent industries, as well as governments and other parties, on the monitoring of surfactant concentrations in various environmental matrices. Recently, the development by CEFIC-LRI of a user-friendly database (Leslie et al., 2004; MonitoringBase, 2004) to store metadata and actual measurements of chemicals in the environment has provided a cost-effective opportunity for ERASM to inventurise and centralise field measurements of surfactants. This will now enable ERASM to create a legacy of its work.

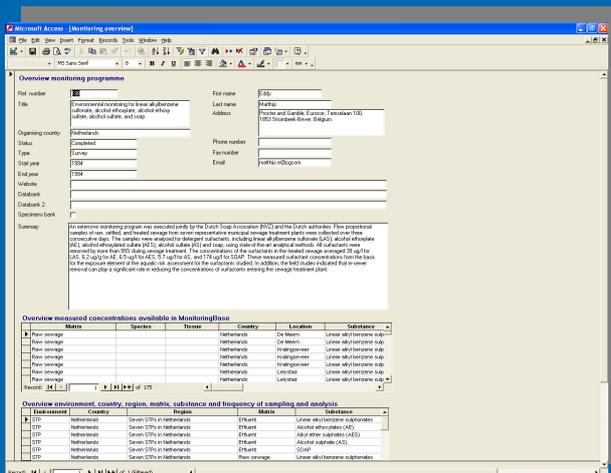
The objective of the current project was therefore:

- to develop a database (MonitoringBase-Surfactants) to store measured environmental concentration data of surfactants,
- to retrieve environmental data of anionic, non-ionic, cationic and amphoteric surfactants in the European environment (water, sediment, agricultural soil, biota, waste water and sludge) for the period 1970 to 2005, and to evaluate, score and load the data in MonitoringBase-Surfactants.

For scoring of the quality of the monitoring studies the Klimisch et al. (1997) approach has been used. This approach is widely used by industry and regulators as the basis for assessing the quality of toxicological and ecotoxicological data on products. It was adapted for the assessment of surfactant data. This work is described in a related poster by Eadsforth et al. (2009).

Example of a Search

The following criteria can be selected for a search: Environment (Fresh, Marine, Estuarine, Terrestrial, STP), the Substance (AE, AES, AS, Alkyl Phenols, DTDMAC, LAS, Soap), the Region (Country or sea) where the samples are taken and the matrix (Water, Sediment, Sewage influent, Sewage effluent, Raw sewage, Settled sludge, Aerobic sludge, Anaerobic Sludge, Soil, Biota, Pore water).



Overview of a study, after double-clicking on the ID or Title cell for a specific programme in the Overview results box.



Entry screen

Technical Aspects and Scope

- Database:** Microsoft Access 2000
- Type of data:** Concentration data of on-going and completed monitoring, survey and laboratory studies for surfactants in the European environment from 36 studies
- Data:** 2000 measured concentration data
- Export:** Word documents, Excel worksheets or for printing directly
- Metadata:** Country, Region, Location, Environment, Substance, Matrix, Organism, Reference, Quality
- Surfactant groups:** Anionics, non-ionics, cationics and amphoteric
- Target substances:** AE, AES, AS, DTDMAC, LAS, Soap. No information was retrieved for betaines, amine oxides, and SPC (Sulphophenyl Carboxylates). These surfactants are therefore not included in the database
- Literature search:** Web of Science and CAB databases, which contain references from peer-reviewed scientific journals dating back to 1945 and 1972, respectively



References

- Klimisch H.J., Andreae M. and Tillmann U. 1997. A systematic approach for evaluating the quality of experimental toxicological and ecotoxicological data. Regulatory Toxicology and Pharmacology, 25, 1-5.
- Leslie H., Kotterman M., Leonards P., MonitoringBase. Collation and evaluation of monitoring programmes and measured environmental concentration data on organic chemicals in European aquatic environments, Final report, n° CO79/04, Nov. 2004.
- MonitoringBase. Database of monitoring programmes for contaminants in the European aquatic environment, [Cd-Rom], ed. By RIVO, Version 1.0, Sept. 2004.
- Eadsforth, C.V. et al., 2009. Application of 'Klimisch' criteria to evaluate the quality of data used in surfactant monitoring studies. Poster, SETAC Gothenburg, June 2009.

