

DEGKINMANAGER - EVALUATION OF WATER SEDIMENT STUDIES INCLUDING VOLATILISATION

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Software DegKinManager is freely available at software.ime.fraunhofer.de

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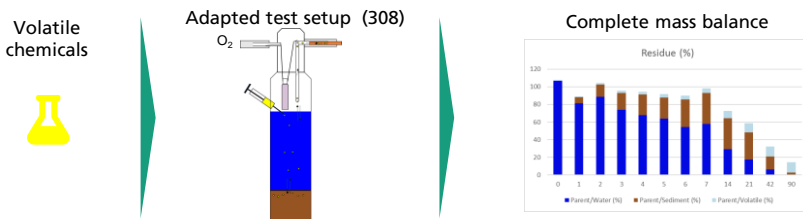
Introduction

- Biodegradation kinetic data is key parameter in environmental risk assessment of chemicals
- Guidelines are not suitable for testing highly volatile chemicals (e.g. OECD 308)

Materials & Method

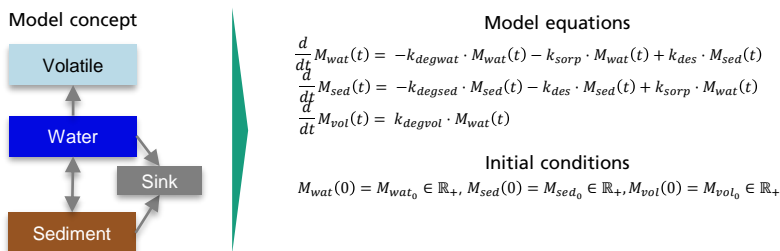
1 New test setup

A closed test setup for biodegradation tests for volatile chemicals was designed



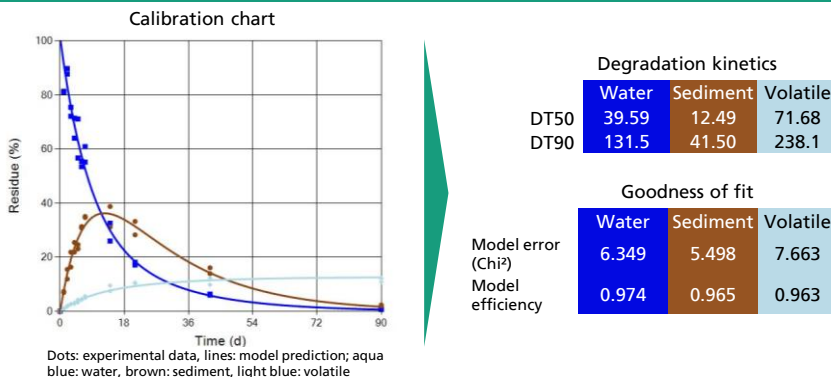
2 Calculation using DegKinManager

A user-friendly standalone software for kinetic evaluation was implemented



3 Kinetic analysis (level II)

Calculation of degradation kinetics for each compartment including volatile is possible



Results & Discussions

- DegKinManager is suitable to describe experimental residue data
- Parent in water is best described, parent in volatile is worst described
- In general, there is a good correspondence between model prediction and data

Conclusions

- Test setup is suitable for obtaining the complete mass balance for a range of volatile chemicals
- Optimization in the test setup is necessary to improve test conditions
- The software is able to evaluate water sediment studies at level II
- Rate constants and DT50 or DegT50 values according to the recommendations of FOCUS Degradation Kinetics (FOCUS 2014) are calculated
- DegKinManager is able to handle volatilising substances

References

FOCUS (2014): "Generic guidance for Estimating Persistence and Degradation Kinetics from Environmental Fate Studies on Pesticides in EU Registration". Version 1.1. 18 December 2014

Klein, Michael (2010): "Calculation of rates constants according to FOCUS degradation kinetics using DegKinManager and ModelMaker." Project report of UBA project FKZ 360 03 048

Shrestha, Prasit, Boris Meisterjahn, Christopher Hughes, Philipp Mayer, Heidi Birch, Judith Klein, Eleni Vaiopoulou, Dieter Hennecke (2019): "Biodegradation testing of volatile chemicals in water-sediment systems (OECD 308)". Talk given by Prasit Shrestha at SETAC Helsinki 2019 on 30 May 2019.