

EVALUATION OF THE RELEVANCE OF DISINFECTION BYPRODUCTS (DBPs) FOR THE ENVIRONMENTAL RISK ASSESSMENT OF BIOCIDES

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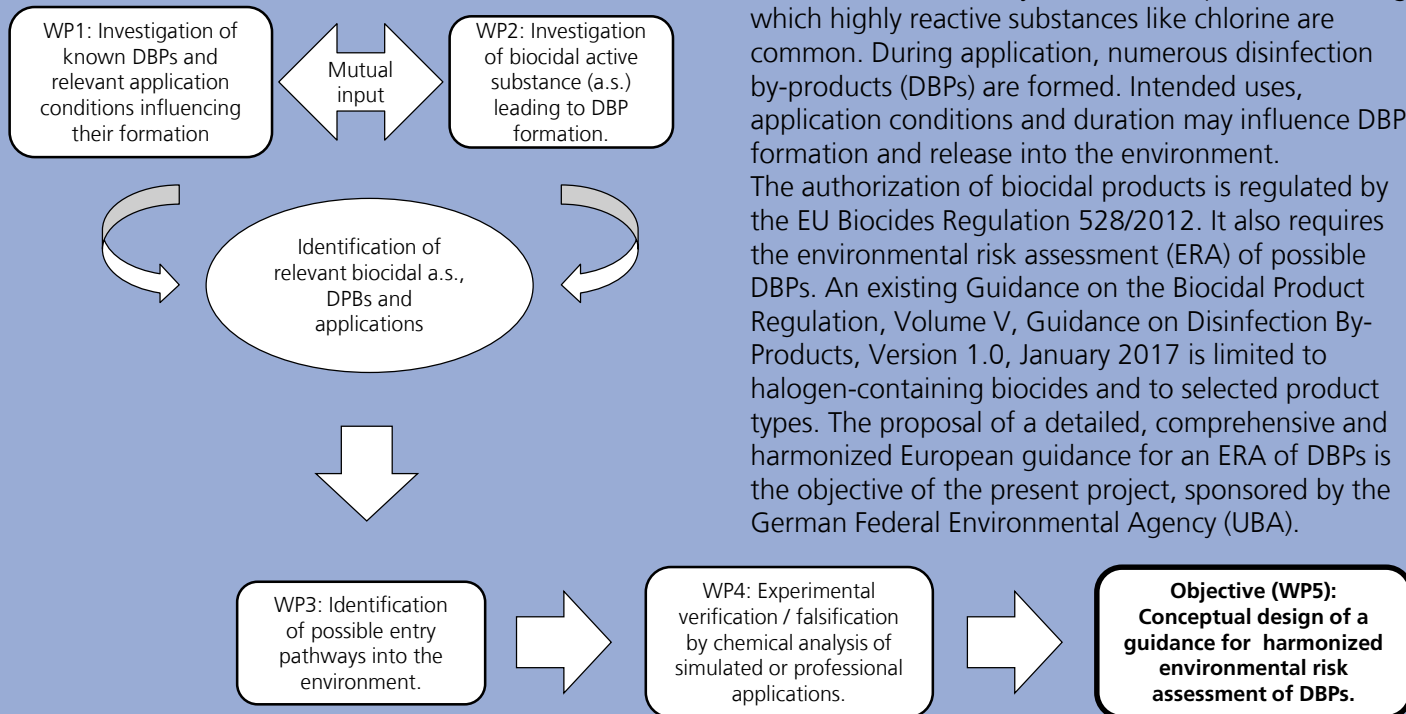
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Strategy and Workpackages



Introduction

Disinfectants are widely used biocidal products, among which highly reactive substances like chlorine are common. During application, numerous disinfection by-products (DBPs) are formed. Intended uses, application conditions and duration may influence DBP formation and release into the environment.

The authorization of biocidal products is regulated by the EU Biocides Regulation 528/2012. It also requires the environmental risk assessment (ERA) of possible DBPs. An existing Guidance on the Biocidal Product Regulation, Volume V, Guidance on Disinfection By-Products, Version 1.0, January 2017 is limited to halogen-containing biocides and to selected product types. The proposal of a detailed, comprehensive and harmonized European guidance for an ERA of DBPs is the objective of the present project, sponsored by the German Federal Environmental Agency (UBA).

Current status

Workpackage 1

- 89 halogenated DBPs (e.g. Trihalomethanes and Haloacetonitriles) and 44 non-halogenated DBPs (e.g. N-nitrosamines) were identified by literature search.
- In total, 469 entries exist presenting the conditions under which DBPs are formed, use pattern (product type), applied biocidal a.s. (if known) and DBP concentrations in environmental samples or test media.
- The database allows for the description of conditions which result in the respective DBP formation.

Outlook

- DBPs listed in WP1 and WP2 need to be prioritized according to their released amount and to their potential to reach the environment.
- A testing strategy will be developed for WP4. This will comprise, e.g.: testing of lead substances, use of sum parameters, sampling strategy (samples from professional applications vs. simulated biocide applications).
- Results of WP1 to WP4 could be used for a further development of ECHA Guidance on Disinfection By-Products.

Workpackage 2

- Approximately 50 biocidal a.s., were identified to be definitely or probably DBP forming.
- Literature search identifies numerous DBPs formed during the biocide application.
- An allocation of occurring DBPs to type of application / product type is possible for many DBPs.
- As further biocidal a.s. are identified in WP2 - other than determined as DBP sources in WP1 - additional DBPs came up.

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Disinfectants are widely used biocidal products. Their scopes of applications are quite broad and include different fields such as (drinking) water, health care, food processing or construction industry. Among the active ingredients used, highly reactive substances like chlorine, peroxides or ozone are common. During their application, numerous disinfection by-products (DBPs) are formed, especially if organic matter is present. Depending on the specific use, the reaction conditions such as presence of water, pH, temperature and application duration differ significantly and may influence the formation of DBPs. The intended use also determines possible releases of the formed DBPs into the environment. This complex situation is not adequately considered within the European biocides regulation at the moment. The authorisation of biocidal products is regulated by the EU Biocides Regulation 528/2012 which also requires the assessment of possible DBPs. The existing Guidance on Disinfection By-Products is limited to halogen-containing biocides and, selected product types and includes only general scientific strategies for the risk assessment of DBPs. A detailed European guidance for an environmental risk assessment (ERA) of DBPs is missing. On this basis a harmonized ERA of biocidal products within the EU is questionable.

In order to fill this regulatory gap and develop a feasible regulatory toolkit, the German Environmental Agency (UBA) launched a research project for the consideration of DBPs within the environmental risk assessment of biocidal products (FKZ 3718 65 403 0). The project aims are a literature search based identification of DBPs relevant for the ERA of biocides and the conditions of use influencing their formation as well as the identification of active ingredients and product types. Moreover possible entry pathways of the DBPs into the environment are investigated. The obtained results are finally complemented by an experimental validation via chemical analysis of simulated product applications.