



**German Chemical Society
Gesellschaft Deutscher Chemiker**

GDCh-Advisory Committee
on Existing Chemicals of
Environmental Relevance (BUA)

BUA Reports 81 and 82

Formic acid, formates
(No. 81; August 1991)

**Diethylene glycol
bis(chloroformate)**
(No. 82; June 1991)



S. Hirzel

Wissenschaftliche Verlagsgesellschaft 1995

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BUA Reports 81 and 82

Formic acid, formates

**Diethylene glycol
bis(chloroformate)**

edited by the GDCh-Advisory
Committee on Existing Chemicals
of Environmental Relevance

Beratergremium für
Umweltrelevante Altstoffe (BUA)



S. Hirzel

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Foreword

The German Chemicals Act (Chemikaliengesetz - ChemG) of 1980 stipulates that certain existing chemicals must be reported to the competent authority, if they exhibit properties which indicate that they may be hazardous, either alone or in combination with other substances.

In the summer of 1982, an Advisory Committee on Existing Chemicals of Environmental Relevance (BUA) was set up by the German Chemical Society (Gesellschaft Deutscher Chemiker - GDCh). It brings together representatives from the scientific community, the chemical industry and the governmental authorities. This Advisory Committee is responsible for elaborating appropriate solutions for substances of relevance for health and the environment on the basis of voluntary measures. It selects and examines existing chemicals from the aforementioned angles. The testing and evaluation are based on scientific criteria alone.

It was, therefore, necessary to develop priority setting procedures. In a first phase reports were only prepared for priority chemicals. Within the framework of a first priority setting procedure, chemicals were compiled from several priority lists and 135 chemicals were selected for detailed substance reports.

In a second priority setting procedure the survey of the German Chemical Industry Association (VCI) on all substances with a production volume of more than 10 tons per year was used as a starting list. Since this survey covered 4,600 chemicals, BUA decided to process the corresponding list in several stages. The first stage included approx. 1,050 substances with a production volume of more than 1,000 tons per year.

Detailed reports are drawn up on chemicals suspected of having a hazard potential and abridged reports on those presenting only a minor hazard potential, according to the current state of knowledge.

The detailed BUA reports take in both the published literature and data from industry. If data for the evaluation of the chemicals are not available, additional studies are recommended and the results are published as updates to the reports. The reports serve as a basis for the instigation of administrative measures, when there are indications of risks to health or the environment.

Tübingen, May 1993

Ernst Bayer
Chairman of the Advisory Committee
on Existing Chemicals
of Environmental Relevance

Formic acid, formates

BUA Report 81 (August 1991)

edited by the GDCh-Advisory
Committee on Existing Chemicals
of Environmental Relevance

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BUA Report on Formic acid, formates

7 Summary and conclusions

Quantities flowing into the wastewater from manufacture are slight; those from usage are considerable but are almost completely degraded during biological treatment. Discharge into the air during manufacture and ancillary processing is comparatively slight. Formic acid forms as a result of atmospheric reactions; its occurrence in rainwater points to washing out from the atmosphere. The amounts discharged by these processes, together with those from commercial usage and as a silage agent for agriculture, are eliminated on account of the ready biodegradability of formic acid and its salts and by partial evaporation of the acid from soil and water. The experimentally determined acute toxicity value for water organisms ranges from 25 to 175 mg l⁻¹ and that for sodium and calcium formate is ≥ 1,000 mg l⁻¹.

In Germany, formic acid has been designated a Group III compound, i.e. it is a compound which, according to current knowledge, constitutes a slight potential hazard to the general population and the environment. This report has confirmed this classification and shown that wide exposure is possible from industrial production and natural sources. The data pertaining to toxicological and ecotoxicological effects do not suggest any possible risk when the known corrosive action is taken into account.

Diethylene glycol bis(chloroformate)
BUA Report 82 (June 1991)

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Committee on Existing Chemicals
of Environmental Relevance

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Diethylene glycol bis(chloroformate)

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BUA Report on Diethylene glycol bis(chloroformate)

8 Summary and recommendations

The manufacture of between 1,000 and 3,000 t y⁻¹ diethylene glycol bis(chloroformate) is estimated to discharge less than 0.1 kg y⁻¹ into the atmosphere. Given a maximum influent level of 0.5 t y⁻¹ into the waste water treatment plant, major discharge into the hydrosphere after the wastewater-treatment plant is not expected, owing to hydrolysis to diethylene glycol, hydrochloric acid and CO₂.

The compound serves exclusively as an intermediate and virtually all (except for less than 1 t y⁻¹) is exported and processed to optical glasses.

The aquatic toxicity is difficult to determine because of the rapid hydrolysis that occurs under static test conditions and is to be regarded as having no environmental impact on account of the negligible potential for exposure.

An LC₅₀ value of 1.78 mg l⁻¹ was the lowest value obtained for acute aquatic toxicity to fish (golden orfe) after each of 24, 48 and 96 hours' exposure.

Diethylene glycol bis(chloroformate) has moderate acute toxicity and irritates skin and mucous membranes of the eyes. A mutagenic potential was not detected in the Ames Test. The compound, which is predominantly used as an intermediate, is being evaluated toxicologically by the Employment Accident Insurance Fund of the Chemical Industry as part of the "Program for the Prevention of Health Damage by Working Materials" with emphasis being placed on the work place. Tests on missing end-points are being considered, where necessary.

Diethylene glycol bis(chloroformate) has been classified as belonging to Group IV (compounds which perhaps constitute a potential risk to human health; this potential risk, however, is of importance only in the work place, in view of the limited possibility of exposure). This report has confirmed this classification and shown that exposure to the compound is possible only in the work place, and not in the environment; nor are consumers likely to be exposed to it. Further investigation of the compound is thus outside the brief of the BUA.