



Scientific Committee on Health and Environmental Risks

SCHER

Risk Assessment Report on Chlorine

Environmental Part

CAS No.: 7782-50-5
EINECS No.: 231-959-5



The SCHER adopted this opinion at its 23rd plenary on 6 May 2008

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Three independent non-food Scientific Committees provide the Commission with the scientific advice it needs when preparing policy and proposals relating to consumer safety, public health and the environment. The Committees also draw the Commission's attention to the new or emerging problems which may pose an actual or potential threat.

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SCHER

Questions relating to examinations of the toxicity and ecotoxicity of chemicals, biochemicals and biological compound whose use may have harmful consequences for human health and the environment.

In particular, the Committee addresses questions related to new and existing chemicals, the restriction and marketing of dangerous substances, biocides, waste, environmental contaminants, plastic and other materials used for water pipe work (e.g. new organics substances), drinking water, indoor and ambient air quality. It addresses questions relating to human exposure to mixtures of chemicals, sensitisation and identification of endocrine disrupters.

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http://ec.europa.eu/health/ph_risk/risk_en.htm

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1. BACKGROUND

Council Regulation 793/93 provides the framework for the evaluation and control of the risk of existing substances. Member States prepare Risk Assessment Reports on priority substances. The Reports are then examined by the Technical Committee under the Regulation and, when appropriate, the Commission invites the Scientific Committee on Health and Environmental Risks (SCHER) to give its opinion.

2. TERMS OF REFERENCE

On the basis of the examination of the Risk Assessment Report the SCHER is invited to examine the following issues:

- (1) Does the SCHER agree with the conclusions of the Risk Assessment Report?
- (2) If the SCHER disagrees with such conclusions, it is invited to elaborate on the reasons.
- (3) If the SCHER disagrees with the approaches or methods used to assess the risks, it is invited to suggest possible alternatives.

3. OPINION

3.1 General comments

The RAR assumes that, due to the high reactivity of chlorine, it is rapidly transformed in the environment and in the aquatic environment it is present as hypochlorous acid or hypochlorite. Therefore, most of the conclusions of the RAR are based on the data and the assessments described in the RAR on sodium hypochlorite.

The SCHER agrees with this procedure. However, in relation to the RAR on sodium hypochlorite, it was opinion of the SCHER that conclusion (ii)¹, proposed by the RAR for all scenarios, was not enough supported (SCHER, 2008).

It is opinion of the SCHER that the same comments are applicable to this RAR.

3.2 Specific comments

3.2.1 Exposure assessment

Chlorine is a high production volume chemical. Production and uses in Europe are estimated in the order of many millions tons per year. However, natural releases in the atmosphere, mainly due to sea aerosols, are several orders of magnitude higher than anthropogenic emissions. Due to the level of natural emissions, the calculation of a regional and continental PEC is assumed as not appropriate and only local PECs are considered.

In the environment chlorine is highly reactive with both organic and inorganic matter. In the aquatic environment at natural pH values, chlorine is present, as hypochlorous acid or hypochlorite. Therefore, to estimate PECs in surface water for different production and uses the RAR refers to the RAR on sodium hypochlorite, where the decay of hypochlorite in the environment is studied with a kinetic model, indicating that disappearance of

¹According to the Technical Guidance Document on Risk Assessment – European Communities 2003:

- conclusion i): *There is a need for further information and/or testing;*
- conclusion ii): *There is at present no need for further information and/or testing and for risk reduction measures beyond those which are being applied already;*
- conclusion iii): *There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.*

hypochlorite is practically immediate in the natural aquatic environment, reaching in a short time concentration as low as 10^{-22} µg/L or less in all emission scenarios. However, it was opinion of the SCHER that the PEC for sodium hypochlorite was not sufficiently supported by the information provided (SCHER, 2008). Therefore, it is opinion of the SCHER that the PEC for chlorine is not acceptable.

For the terrestrial environment, PEC is assumed as negligible due to rapid reaction with organic matter.

In the atmosphere, chlorine rapidly undergoes photochemical reactions. The local PEC calculated for production and uses is within the range of the natural concentrations present in the marine boundary layer.

3.2.2 Effect assessment

For effects, the RAR refers to the information reported in the RAR on sodium hypochlorite. For the aquatic environment, the same PNEC as for sodium hypochlorite (0.04 µg/L as free active chlorine) is proposed.

The SCHER agrees with the proposed PNEC.

No toxicity data are available for sediments and for the terrestrial compartment as well as for secondary poisoning. Being exposure in these compartments negligible and being transfer in the trophic chain not applicable, the RAR assumes that effect assessment is not relevant in these cases. The SCHER agrees with these assumptions.

For the atmosphere, the only available data are effects on plants. The lowest concentration producing effects (0.1 ppm after 2 hours of exposure) is assumed as a threshold of effect for damage to plants. A precise PNEC cannot be calculated.

3.2.3 Risk characterisation

For the aquatic compartment, conclusion (ii) is based on the very low PEC that is not enough supported by information provided. Therefore it is opinion of the SCHER that this conclusion is not acceptable. More information is needed for supporting the PEC.

For the atmosphere, conclusion (ii) is proposed, based on the assumption that PEC is of the same order of magnitude of natural concentrations present in the marine boundary layer and that a threshold of effects for plants is two orders of magnitude higher. Considering the difficulties for obtaining a more precise PEC/PNEC value and the rapid photochemical transformation of chlorine, the SCHER agrees with this conclusion.

The SCHER also agrees with conclusion (ii) proposed for the terrestrial environment due to the negligible exposure, as well as for secondary poisoning, being not applicable to chlorine.

4. LIST OF ABBREVIATIONS

PEC	Predicted Environmental Concentration
PNEC	Predicted No Effect Concentration
RAR	Risk Assessment Report

5. REFERENCES

SCHER, scientific opinion on the risk assessment report on sodium hypochlorite (CAS 7681-52-9), environmental part, 12 March 2008