Scientific Committee on Health and Environmental Risks

SCHER

OPINION ON

"CHEMICALS AND THE WATER FRAMEWORK DIRECTIVE: DRAFT ENVIRONMENTAL QUALITY STANDARDS"

Ibuprofen

SCHER adopted this opinion at its 12th plenary on 30 March 2011

About the Scientific Committees

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.

They are: the Scientific Committee on Consumer Safety (SCCS), the Scientific Committee on Health and Environmental Risks (SCHER) and the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) and are made up of external experts.

In addition, the Commission relies upon the work of the European Food Safety Authority (EFSA), the European Medicines Evaluation Agency (EMEA), the European Centre for Disease prevention and Control (ECDC) and the European Chemicals Agency (ECHA).

SCHER

Opinions on risks related to pollutants in the environmental media and other biological and physical factors or changing physical conditions which may have a negative impact on health and the environment, for example in relation to air quality, waters, waste and soils, as well as on life cycle environmental assessment. It shall also address health and safety issues related to the toxicity and eco-toxicity of biocides.

It may also address questions relating to examination of the toxicity and eco-toxicity of chemical, biochemical and biological compounds whose use may have harmful consequences for human health and the environment. In addition, the Committee will address questions relating to methodological aspect of the assessment of health and environmental risks of chemicals, including mixtures of chemicals, as necessary for providing sound and consistent advice in its own areas of competence as well as in order to contribute to the relevant issues in close cooperation with other European agencies.

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1. BACKGROUND

Article 16 of the Water Framework Directive (WFD, 2000/60/EC) requires the Commission to identify priority substances among those presenting significant risk to or via the aquatic environment, and to set EU Environmental Quality Standards (EQSs) for those substances in water, sediment and/or biota. In 2001 a first list of 33 priority substances was adopted (Decision 2455/2001) and in 2008 the EQSs for those substances were established (Directive 2008/105/EC or EQS Directive, EQSD). The WFD Article 16 requires the Commission to review periodically the list of priority substances. Article 8 of the EQSD requires the Commission to finalise its next review by January 2011, accompanying its conclusion, where appropriate, with proposals to identify new priority substances and to set EQSs for them in water, sediment and/or biota. The Commission is now aiming to present its proposals to Council and the Parliament by June 2011.

The Commission has been working on the abovementioned review since 2006, with the support of the Working Group E (WG E) on Priority Substances under the Water Framework Directive Common Implementation Strategy. The WG E is chaired by DG Environment and consists of experts from Member States, EFTA countries, candidate countries and more than 25 European umbrella organisations representing a wide range of interests (industry, agriculture, water, environment, etc.). A shortlist of 19 possible new priority substances was identified in June 2010. Experts nominated by WG E Members (and operating as the Sub-Group on Review of Priority Substances) have been deriving EQS for these substances and have produced draft EQS for most of them. In some cases, a consensus has been reached, but in some others there is disagreement about one or other component of the draft dossier. Revised EQS for a number of existing priority substances are currently also being finalised.

The EQS derivation has been carried out in accordance with the draft Technical Guidance on EQS reviewed recently by the SCHER. DG Environment and the rapporteurs of the Expert Group that developed the TGD have been considering the SCHER Opinion and a response is provided separately.

2. TERMS OF REFERENCE

2.1 General requests to SCHER

DG Environment now seeks the opinion of the SCHER on the draft EQS for the proposed priority substances and the revised EQS for a number of existing priority substances. The SCHER is asked to provide an opinion for each substance. We ask that the SCHER focus on:

1. **whether the EQS have been correctly and appropriately derived, in the light of the available information[1] and the TGD-EQS;**

2. **whether the most critical EQS (in terms of impact on environment/ health) has been correctly identified.**

[1] The SCHER is asked to base its opinion on the technical dossier and the accompanying documents presented by DG Environment, on the assumption that the dossier is sufficiently complete and the data cited therein are correct.

Where there is disagreement between experts of WG E or there are other unresolved issues, we ask that the SCHER consider **additional points**.

2.2 Specific requests on ibuprofen

No EQS dossier is provided at this point. The issue of whether there is a sufficient basis to propose ibuprofen as a priority substance is still being discussed. A draft EQS of 0.01 µg/L has been proposed based on data including a study by Han et al (2010). However, there is disagreement between Member State and stakeholder group experts within the Sub-Group regarding the reliability of the study. Therefore the SCHER is asked to consider the arguments put by the stakeholder group experts (who attribute a reliability score of 3) and the Member State experts (who attribute a reliability score of 2). Two papers containing the arguments are provided – a technical appraisal by the stakeholder group experts and a response to that appraisal by the Member State experts.
The SCHER is asked to comment on the argumentation, on the reliability of the Han et al study itself and thus on the appropriateness of using the study to derive an EQS for ibuprofen.

3. OPINION

3.1. Responses to the general requests

1. whether the EQS have been correctly and appropriately derived, in the light of the available information and the TGD-EQS;

As there is currently no EQS dossier for the substance ibuprofen SCHER is not able to judge the EQS proposed. It is assumed that the above specific request requires an answer before an EQS proposal is sent to SCHER.

2. whether the most critical EQS (in terms of impact on environment/health) has been correctly identified.

SCHER's position is the same as mentioned under point 3.1.1.

3.2. Responses to the specific requests on ibuprofen

The SCHER is asked to comment on the argumentation, on the reliability of the Han et al study itself and thus on the appropriateness of using the study to derive an EQS for ibuprofen.

Opinion of the SCHER:

Observations:
The stakeholders considerd the study by Han et al. (2010) not suitable for the abstraction of the draft EQS. The reasoning focussed on 4 main topics:

- Study design: the stakeholder appraisal gives 6 points of criticism:
    - measurements are pseudo-replicated by combining juvenile fish in one exposure vessel per concentration at some point between 30 dph and 90 dph;
    - measurement of exposure concentrations took only place at the beginning and end of a single 48-h period;
    - the test concentrations were separated by a factor of 10 instead of the normal factor of 3.2;
    - data have not been transformed before statistical analysis;

    - outliers have been deleted without explanation; and
    - not sufficient fertilised eggs per replicate have been used.
- Analytical determination of test concentrations: Although there was confirmation on one occasion that the nominal exposure concentration was close to the real concentration, no information is provided that this is the case during the whole process including test medium replacement.
- Dose-response: Due to lack of consistent dose-responses for female GSI and number of eggs per brood, which were found to be significantly different from the control at intermediate concentration and for the time-to-hatch, which showed a non monotonous dose-response, doubt was raised about the apparent effects.
- Statistical analysis: The paper is unclear in the description of the statistical methods performed and in the treatment of outliers.

Based on these 4 points of criticism the stakeholder appraisal concludes that the study of Han et al. (2010) should probably be regarded as a paper with a quality score of 3 (according to Klimisch et al. 1997) after full reanalysis of the raw data.

According to the Member States the dose-response for survival of fish could not be invalidated although there are several unclear dose-responses. In addition correspondence with the authors is reported providing more clarification on the tests performed, also based on information from posters presented by Finnish authors (Kallio et al., 2010 and Lahti et al., 2010) at the SETAC-meeting in Seville in 2010. The Member States accepted the different shortcomings of the Han et al paper and valued the paper with a reliability index of 2 (according to the Klimisch scoring system (Klimisch et al., 1997)).

Conclusion of the SCHER:
The article of Han et al (2010) should not be used for deriving the final proposal of an EQS for the substance ibuprofen. The reasons for this opinion are as follows:

- The authors did the utmost to adapt the available OECD TG210 to a useful protocol for the goal of the research carried out by Han et al. (2010), being the establishment of potential endocrine disrupting effects of ibuprofen, as the latest guideline was not yet available for them;
- The results achieved by Han et. (2010) are intermediate results in the research programme;
- Several inadequacies in the study design and performance could be identified compared to a study directed with the ultimate goal of determining the NOEC of ibuprofen for 3 different aquatic organisms
    - the wide range of exposure concentrations;
    - the determination of measured concentrations at regular intervals;
    - the number of organisms and eggs in the different exposure regimes; and
    - the thoroughness of the statistical analysis.
- The MS expert group itself does not seem to be in full support and acceptance of the original paper by Han et al. (2010) as it was found necessary to contact the authors for further information. In addition, recent information was used to support its view (Kallio et al., 2010 and Lahti et al., 2010). These 2 references should be considered as personal communications as the results on these posters are not yet published.
- Although there are indications that the substance ibuprofen has effects on aquatic organisms at quite low levels, at or even below 0.01 µg/L, the information available should not lead to a determination of an EQS of 0.01 µg/L at this moment.

The additionally raised points received by supplement (Annex 5 Supplement, 30 January 2011) do not alter the position of the SCHER.

Therefore, the SCHER concludes that the study of Han et al., (2010) should be used as indicative and not as determining in the setting of an EQS for the substance ibuprofen. This means that a classification according to the Klimisch score (Klimisch et al., 1997) of 3 is warranted.

Considering all information and arguments given above the final conclusion of the SCHER is that the study of Han et al. (2010) should not be considered as the key study for the determination of an EQS for ibuprofen.

4. LIST OF ABBREVIATIONS

AA-QS	annual average quality standard
DAR	draft assessment report
dph	days post hatch
EQS	environmental quality standard
FOCUS	FOrum for the Coordination of pesticide fate models and their USe
GSI	gonadosomatic index
HC5	hazardous concentration for 5% of the species
MAC-QS	maximum allowable concentration quality standard
NOEC	No observed effect concentration
PEC	Predicted Environmental Concentration
OECD	Organization for Economic Cooperation and Development
PBT	Persistent, Bioaccumulative and Toxic
SETAC	Society of Environmental Toxicology and Chemistry
TGD-EQS	Technical Guidance Document - Environmental Quality Standards
WFD	Water Framework Directive

5. REFERENCES

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