July 12, 2004

Richard Henrich
Manager, Corporate Regulatory Affairs
Great Lakes Chemical Corporation
P.O. Box 2200
West Lafayette, IN 47996

Dear Mr. Henrich:

The Office of Pollution Prevention and Toxics is transmitting EPA's comments on the robust summaries and test plan for Dibromostyrene posted on the ChemRTK HPV Challenge Program Web site on February 4, 2004. I commend the Great Lakes Chemical Corporation for its commitment to the HPV Challenge Program.

EPA reviews test plans and robust summaries to determine whether the reported data and test plans will provide the data necessary to adequately characterize each SIDS endpoint. On its Challenge Web site, EPA has provided guidance for determining the adequacy of data and preparing test plans used to prioritize chemicals for further work.

EPA will post this letter and the enclosed comments on the HPV Challenge Web site within the next few days. As noted in the comments, we ask that Great Lakes Chemical Corporation advise the Agency, within 60 days of this posting on the Web site, of any modifications to its submission. Please send any electronic revisions or comments to the following e-mail addresses: oppt.ncic@epa.gov and chem.rtk@epa.gov.

If you have any questions about this response, please contact Richard Hefter, Chief of the HPV Chemicals Branch, at 202-564-7649. Submit questions about the HPV Challenge Program through the "Contact Us" link on the HPV Challenge Program Web site pages or through the TSCA Assistance Information Service (TSCA Hotline) at (202) 554-1404. The TSCA Hotline can also be reached by e-mail at tsca-hotline@epa.gov.

I thank you for your submission and look forward to your continued participation in the HPV Challenge Program.

Sincerely,

-S-

Oscar Hernandez, Director
Risk Assessment Division

Enclosure

cc: W. Penberthy
M. E. Weber

EPA Comments on Chemical RTK HPV Challenge Submission:
Benzene, Ethenyl-, Aryl-bromo Derivatives

Summary of EPA Comments

The sponsor,Great Lakes Chemical Corporation, submitted a test plan and robust summaries to EPA for , ethenylbenzene, aryl bromo derivatives (dibromostyrene, CAS No. 125904-11-2), dated December 18, 2003. EPA posted the submission on the ChemRTK HPV Challenge Web site on February 4, 2004.

EPA has reviewed this submission and has reached the following conclusions:

1. Physicochemical Properties. The submitter needs to revise its boiling point value.

2. Environmental Fate. The submitter needs to check its hydrolysis results. If hydrolysis is in fact occurring, then the submitter needs to report the hydrolysis reaction products. The submitter needs to provide measured ready biodegradation data. The submitter needs to include its EPIWIN fugacity model information in the robust summary, and include all input values used to run the model.

3. Health Effects. Adequate data are available for all health endpoints for purposes of the HPV Challenge Program.

4. Ecological Effects. EPA agrees with the sponsor's proposal to test dibromostyrene for all ecological effects endpoints.

EPA requests that the submitter advise the Agency within 60 days of any modifications to its submission.

EPA Comments on the Ethenylbenzene Aryl-bromo Derivatives Challenge Submission

Chemical Identity

Although the physicochemical property and environmental fate sections of the robust summaries state or imply the presence of mono-, di-, and tribromostyrenes in the sponsored substance, there is no discussion of multiple constituents in the test plan (one robust summary describes a test substance as 10% mono, 85% di and 5 % tri). The submitter should include a discussion of the typical composition of the substance, including isomers (e.g., does the single structure shown in the test plan represent all the dibromostyrene typically present?). Possible effects of substance composition variations on the testing outcomes should also be addressed.

Test Plan

Physicochemical Properties (melting point, boiling point, vapor pressure, partition coefficient and water solubility)

The data provided by the submitter for melting point, vapor pressure, partition coefficient, and water solubility are adequate for the purposes of the HPV Challenge Program.

Boiling Point. The submitter provided a boiling point of 95 ^{o}C but no experimental details. This value is far below a measured value located by EPA of 209.2 ^{o}C (Syracuse 2004) for 2-bromostyrene and an estimated value of 202.2 ^{o}C for CAS number 125904-11-2 using EPIWIN. EPA found in the submitter's cited reference that the value of 95 ^{o}C was obtained at a reduced pressure of 3 mm Hg (Great Lakes 2004). EPA extrapolated the latter value to 760 mm Hg for a value of 232.6 ^{o}C. The Agency considers the submitted data adequate pending addition of the measurement pressure to the robust summary. EPA also recommends that the submitter extrapolate the value at 3 mm Hg to a value at 760 mm Hg.

Environmental Fate (photodegradation, stability in water, biodegradation, fugacity)

The data provided by the submitter for photodegradation are adequate for the purposes of the HPV Challenge Program.

Stability in water. The robust summary reported that the substance was "degraded" in this test. Halogenated aromatics are generally resistant to hydrolysis at room temperature and pH range 4-9. Polymerization may account for the loss of the parent compound. The submitter did not report on degradation products, so it is difficult to interpret the results. The submitter needs to provide more information and discussion of this issue, and, if possible, the identity of the hydrolysis products. On page 6 of the test plan a temperature of 19 °C is reported versus 15 °C in the robust summary.

Biodegradation. The estimated data provided by the submitter are not adequate for the purposes of the HPV Challenge Program. The submitter needs to measure ready biodegradation for this chemical following OECD Guideline 301 and provide this information in a robust summary.

Fugacity. The fugacity data provided by the submitter are adequate for the purposes of the HPV Challenge Program. However, the submitter needs to include its EPIWIN fugacity model information in the robust summary and include all input values to the model.

Health Effects (acute toxicity, repeated-dose toxicity, genetic toxicity, and reproductive/developmental toxicity)

EPA agrees with the submitter that no additional testing is needed for health effects endpoints for the purposes of the HPV Challenge Program. Some deficiencies in the robust summaries need to be addressed.

Ecological Effects (fish, invertebrates, and algae)

EPA agrees with the sponsor's proposal to test dibromostyrene for all ecological effects endpoints (i.e., fish, daphnia, and green algae). The tests need to be conducted following OECD testing guidelines, to incorporate measured concentrations, closed systems, and zero head space to account for any losses due to volatility. The purity and composition of the test substance need to be specified.

Specific Comments on the Robust Summaries

Generic comments

In general, the robust summaries did not provide enough details. The submitter should consult EPA guidance documents for the preparation of robust summaries (http://www.epa.gov/opptintr/chemrtk/guidocs.htm).

Health Effects (acute toxicity, repeated-dose toxicity, genetic toxicity, and reproductive/developmental toxicity)

The purity and composition of the test substance, the study method or test guideline, and the statistical methods need to be stated in each robust summary.

Acute toxicity. The robust summary for the acute oral toxicity test (WIL-12007, 1983) is missing details including test substance purity, body weight determinations, tissues examined at necropsy, time of death following dosing, and clinical and necropsy observations by dose level and sex.

Repeated-dose toxicity. The robust summary for the 90-day gavage study is missing details including test substance purity, statistical methods, a list of the clinical chemistry and blood parameters evaluated, a list of organs and tissues examined at necropsy, and statistical evaluation of reported findings.

Genetic toxicity. The robust summary for the Ames assay is missing details including test method or guideline, test substance purity, culture conditions and medium, strains used, number of replicates per

concentration, identity and source of metabolic activation, criteria for a positive response, information on positive and negative controls, mean number of revertant colonies per plate, statistical methods and results, and cytotoxicity. The robust summaries on the chromosome aberrations studies are missing details including test method or guideline, test substance purity, culture conditions and medium, number of replicates per concentration, duration of exposure, source of metabolic activation, criteria for a positive response, information on positive and negative controls, number of cells with aberrations and type of aberrations for both treated and control cultures, and statistical methods and results.

Reproductive toxicity. The robust summary for the two-generation reproductive toxicity study is missing details including the test substance purity, statistical methods, list of organs and tissues examined at necropsy, list of reproductive parameters evaluated, clinical toxicity observations during treatment, statistical evaluation of results, and tabulations of mortality, toxicity observations, and necropsy findings by dose level, sex, and generation.

Developmental toxicity. The robust summaries for four studies in rabbits and rats for the developmental toxicity endpoint are missing details including test substance purity, list of developmental endpoints evaluated, list of parental organs and tissues examined at necropsy, proportion of fetuses examined for (external, skeletal, and visceral) malformations, statistical methods and significance of results, and tabulations of signs of toxicity and necropsy findings by dose level and sex.

Followup Activity

EPA requests that the submitter advise the Agency within 60 days of any modifications to its submission.

References

Syracuse Research Corp. PHYSPROP Database. Syracuse, NY (2004). 2-Bromostryrene.

Great Lakes Chemical Corporation. Technical Information Sheet.
http://www.pa.greatlakes.com/pdf/datasheet/DBS%20Data%20Sheet.PDF (2004)