



Lyondell Chemical Company  
One Houston Center, Suite 700  
1221 McKinney  
Houston, TX 77010  
P.O. Box 3646 (77253-3646)

Phone: 713.652.7200

June 02, 2005

Stephen L. Johnson, Administrator  
US Environmental Protection Agency  
P.O. Box 1473  
Merrifield, VA 22116

Attention: Chemical Right to Know Program

Re: Lyondell Chemical Company Data Review and Assessment for Allyl Alcohol  
(CAS RN 107-18-6)

Dear Mr. Johnson:

Lyondell Chemical Company has reviewed the EPA's comments concerning its data review and test plan for allyl alcohol (CAS RN 107-18-6) under the High Production Volume (HPV) Chemical Challenge Program and has made the following listed changes requested in the EPA comments.

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

**Test Plan Comment:** *Stability in Water.* EPA agrees with the submitter's statement that allyl alcohol is not susceptible to hydrolysis; however, the submitter needs to incorporate this information in the robust summary.

**Response:** The information concerning the lack of groups susceptible to hydrolysis has been incorporated into the robust summary section pertaining to stability in water.

**Ecological Effects (fish, invertebrates, and algae)**

**Test Plan Comment:** *Fish, Invertebrates, and Algae.* The submitted test data for fish are adequate, but those for invertebrates are inadequate because of study and reporting limitations. There are no data for algae. EPA agrees with the submitter's plan to conduct tests on invertebrates and algae, but emphasizes the use of mean measured concentrations.

**Response:** Guideline toxicity tests were conducted for allyl alcohol in aquatic invertebrates and algal (OECD TG 202 and 201, respectively) and the description and findings of these studies are reported in the Data Review and Assessment report and in

05 JUN 16 AM 11:39  
RECEIVED  
OPPT/ODIC

robust summaries in the IUCLID data set. The results of the tests are reported as the mean measured concentrations (adjusted for analytical recovery).

**Robust Summary Comment:** *Fish*. The robust summary does not provide the water temperature values for each test.

**Response:** The Ewell *et al.* (1986) article reports only the targeted test temperature conditions and does not note the measured values that were stated to have been collected daily. The robust summary for this study was revised to note the targeted temperature conditions. The robust summary for the Bridie *et al.* (1979b) study notes the targeted temperature of 20 °C; however, the targeted temperature range for the study has been added. The Bridie *et al.* (1979b) article does not report measured temperature values.

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

**Test Plan Comment:** *Acute Toxicity*. The submitter needs to be aware that data submitted to EPA show that dermal administration of  $\leq 84$  mg/kg-day to rabbits resulted in convulsions (TSCATS 1992).

**Response:** A search was conducted of TSCATS for this information. A 1992 submission was identified from DuPont (Microfiche No. OTS0571504, New Doc ID 88-920009853) that notes acute oral and dermal toxicity findings for allyl alcohol. The dermal study in rabbits notes the LD<sub>50</sub> value and local skin effects but does not report convulsions. If EPA can specifically identify the TSCATS document that reports convulsions from dermal exposure to allyl alcohol, Lyondell will acquire and review this information for possible inclusion in the allyl alcohol HPV documentation.

**Test Plan Comment:** *Repeated-Dose Toxicity*. Although two of the three existing studies are limited (low airflow in the inhalation study, incomplete histopathologic evaluation in an oral study), the data are adequate on a weight-of-evidence basis. In addition, ongoing 13-week oral NTP studies in mice and rats will provide additional data.

**Response:** As of the date of this letter, NTP has not released the report (TOX-48) of their 13-week studies in mice and rats.

**Test Plan Comment:** *Genetic Toxicity*. Table 6 of the test plan incorrectly cites a gene mutation assay in various Salmonella strains as Lijinsky and Andrews (1987). The correct citation is Lijinsky and Andrews (1980).

**Response:** Table 6 has been corrected as noted.

**Test Plan Comment:** *Reproductive Toxicity*. Data from the 15-week repeated-dose drinking water study, from the two ongoing 13-week NTP studies, and from the proposed developmental toxicity study or the EPA-recommended reproductive/developmental toxicity screening study (OECD TG 421; see below) will provide adequate data for this

endpoint. The data from the repeated-dose study and data from the proposed screening study need to be presented in separate robust summaries.

**Response:** Reproductive toxicity for allyl alcohol can be characterized based on (1) the assessment of reproductive tissue in a repeated exposure study (Carpanini *et al.*, 1978) and sperm and male fertility data from a male dominant lethal assay (Jenkinson and Anderson, 1990), 2) data from a guideline developmental toxicity study conducted by Lyondell, and 3) anticipated data from the ongoing NTP repeated-dose toxicity studies.

**Test Plan Comment: *Developmental Toxicity.*** The submitter plans to conduct a developmental toxicity study following OECD TG 414. EPA suggests that the submitter consider using OECD TG 421 (reproductive/developmental toxicity screen protocol) based on the HPV Challenge Program policy for all new developmental toxicity studies (FR notice 65 81686-81698, Dec.26, 2000 <http://www.epa.gov/chemrtk/ts42213.pdf>). The submitter needs to specify species and route of exposure.

**Response:** Consideration was given to using the screening assay OECD TG 421; however, based on the existing knowledge of the liver toxicity of allyl alcohol, a guideline developmental toxicity study (OECD TG 414) was concluded to provide a more robust characterization of the potential for allyl alcohol to produce developmental toxic effects. A detailed explanation of our reasons in selecting the OECD TG 414 study was provided to EPA in our letter to M.O. Leavitt dated September 24, 2004. The study has been completed and was conducted in Sprague-Dawley rats using oral gavage as the route of exposure. The description and findings of the developmental toxicity study are reported in the Data Review and Assessment report and in a robust summary in the IUCLID data set.

**Robust Summary Comment: *Acute Toxicity.*** Robust summaries for acute oral gavage studies in rats do not include information on body weight monitoring and the dose levels tested.

**Response:** The Jenner *et al.* (1964) article does not report the dosages tested or on body weight effects. The robust summary for this study was revised to note the absence of this information. The robust summary for the Dunlap *et al.* (1958) study notes the range of doses tested, however, no information is presented on body weights. The Dunlap *et al.* (1958) robust summary was revised to note the absence of reported information on body weights.

**Robust Summary Comment: *Repeated-Dose Toxicity.*** A robust summary for a 15-week oral toxicity study in rats does not include information on the full range of tissues examined.

**Response:** The robust summary for the Carpanini *et al.* (1978) was revised to note information on the full range of tissues examined.

**Robust Summary Comment:** *Genetic Toxicity.* A robust summary for a negative *in vivo* micronucleus test assay in rat bone marrow cells does not report the number of animals in the positive control group.

**Response:** The available information for the *in vivo* micronucleus assay in the rat (NTP, unpublished results) does not note the number of animals included in the positive control group. Group sizes, as noted on the robust summary, were only given for the treatment groups and the vehicle (negative) control group.

In addition to the above specified changes, three recent genotoxicity studies for allyl alcohol sponsored by Hercules Incorporated have been incorporated into the allyl alcohol robust summaries and assessment report.

Enclosed are (1) a revised data review and assessment report for allyl alcohol and (2) revised robust summaries for allyl alcohol presented in IUCLID format. Lyondell's assessment is that adequate information is now available to meet the HPV Challenge requirements for allyl alcohol.

In preparing this review, testing and assessment, Lyondell has given careful consideration to the principles contained in the letter EPA sent to all HPV Challenge Program participants on October 14, 1999. As requested by EPA in that letter, Lyondell has sought to maximize the use of existing data, scientifically appropriate categories of related chemicals, and structure activity relationships. Also as requested in the October letter, in analyzing the adequacy of existing data, Lyondell has conducted a thoughtful, qualitative analysis rather than a rote checklist approach.

If you have any questions, please contact me at 713.652.7339 or at [claude.white@equistarchem.com](mailto:claude.white@equistarchem.com).

Sincerely,

Dr. Wm. Claude White  
Manager, Product Safety  
Lyondell Chemical Company

Electronic Copy with attachments to:

1. [opt.ncic@epa.gov](mailto:opt.ncic@epa.gov)
2. [chem.rtk@epa.gov](mailto:chem.rtk@epa.gov)