UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

EPA-SAB-EHC-89-008

October 14, 1988

OFFICE OF
THE ADMINISTRATOR

Honorable Lee M. Thomas
Administrator
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Subject: Science Advisory Board's review of issues relating to the health assesment document for PHOSGENE

Dear Mr. Thomas,

The Science Advisory Board's Environmenal Health Committee has completed its review of the issues pertaining to the health assessment document for phosgene, at its meeting July 14-15, 1988 in Washington, D.C.

The available data are inadequate for assessing the health effects of intermittent or chronic exposure to low concentrations of phosgene. The Environmental Health Committee recommends that to help identify data gaps, that a tabulated comparison between known data on the health effects of phosgene be made with other more completely investigated compounds. While other compounds (e.g. ozone) would be chemically different, the tabulation will help provide a model for further research on phosgene. Chronic intermittent and/or lifetime exposure may be the focus of regulatory action, therefore, exposure assessment data are necessary to determine the exposure levels for health effects research. In the document, the highest concentration of phosgene reported in ambient air was 61.1ppt. Inclusion of actual environmental data, and dispersion/exposure modeling will provide a better measure of the potential hazard when chronic exposure health effects are available.

The Committee agrees with the research needs as described in the document. In chronic inhalation studies, the committee suggests that, over time, endpoints be assayed such as changes in pulmonary lavage protein content, pulmonary function and histological alterations (increased collagen, cellular damage in airways and alveoli, hyperplasia and tumors). If phosgene is a carcinogen the primary targets would likely be the lung and nose.

The concentration times time (CxT or exposure concentration times time of exposure) relationship appears to be invalid at low concentrations (Diller, Bruch, and Dehnen, 1985) and it is recommended that CxT not be used to extrapolate to chronic effects. Morever, the data do not support the reversibility of phosgene toxicity. Even though there is scant evidence supporting systemic distribution of phosgene, it is possible that the chemical may be a developmental toxicant as a result of hypoxia.

The Committee concludes that the changes made in the phosgene document in response to comments of peer review panel members are reasonable. In considering the public comments the Committee recommends that studies of potential carcinogenicity, mutagenicity, reproductive and developmental effects of phosgene must be included in the document whether they are positive or negative. Phosgene may be a lung carcinogen in animals chronically exposed by inhalation but no adequate studies have been performed to examine this possibility. The compound may be a developmental toxicant as a result of hypoxia.

We appreciate the opportunity to conduct this particular scientific review. We request that the Agency formally respond to the scientific advice provided herein.

Sincerely,

Norton Nelson
Chairman, Executive Committee

Richard A. Griesemer
Chairman
Environmental Health Committee

U.S. ENVIRONMENTAL PROTECTION AGENCY
SCIENCE ADVISORY BOARD
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