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TEXAS DIVISION
FREEPORT, TEXAS 77541

R&S 028796

ENVIRONMENTAL HEALTH REPORT

EXPOSURE OF B-2800 BLOCK
ALPHA DICHOROETHANE PLANT
EMPLOYEES TO CHLORINATED HYDROCARBON
VAPORS

FILE NO. B28-976

DATE October 11, 1976

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CHECKED R. L. Daniel

DATE October 18, 1976

Summary

The eight hour time weighted average exposures of chlorinated hydrocarbon vapors to Control A operators at the B-2800 Block Alpha-Di Plant are well below both OSHA and Dow exposure limits.

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INTRODUCTION

Environmental Health Services was asked to evaluate the exposure of operations personnel at the B-2800 Alpha Di Plant. The sampling was done by A. D. Adams of the Trichlor Lab and the analyses performed by the Chromatography Group of Central Lab.

METHODOLOGY

Personnel samples were taken on 10 grams of Pittsburgh PCB type, 12 X 30 mesh charcoal using a Bendix Corp. Micronair pump as a vacuum source. The pump and charcoal system were calibrated for flow before use. A full shift, nominal seven hour sample, was taken in each instance. The sampler was worn in the breathing zone. Spent charcoal was removed from the sampling device and brought to B-2406 for analysis by the Gas Chromatography Section of Central Lab. Charcoal is added to chilled high purity carbon disulfide, shaken on a wrist shaker for 30 minutes and held in a refrigerator for analysis by gas chromatography. Analyses were performed on a hydrogen flame ionization type chromatograph.

Exposure concentrations were calculated as parts per million by volume.

PROCESS

There are three units at the Alpha Plant; the EDC unit, the EDC Cracking Unit, and the Alpha Di Unit.

The EDC Unit produces ethylene dichloride by the direct chlorination of ethylene gas in a boiling liquid bed. EDC from the reactor is of rather high purity and passes either to storage or to the EDC Cracking. EDC is thermally dehydrochlorinated to produce vinyl chloride. The reactor gas is quenched in EDC and sent to the Alpha Di production unit without purification. There is no storage of vinyl chloride; it is used as it is made. Crude vinyl chloride and hydrogen chloride react in the presence of a ferric chloride catalyst to form the product, alpha-dichloroethane. Conventional distillation is used to purify product from the alpha-di reactor. Product is stored in the block and sent to the A-2400 Block for use in the methylchloroform process.

All process vents are piped to the thermal oxidizer in the block for conversion to aqueous HCl.

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DEPARTMENT

Health & Environmental Research

TITLE

PRELIMINARY EVALUATION OF PERSONNEL EXPOSURES TO THE RESIDUAL
MONOMERS IN SARAN MICROSPHERES DURING OPERATION OF THE DRY
FOAMER IN 684 BUILDING

AUTHOR(S) SIGNATURE(S)

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DESCRIPTIVE SUMMARY
WITH CONCLUSIONS:

(Include in this space references to data books, and to earlier related reports, patents and publications.)

Two "grab" samples were collected at breathing zone locations near the "wet" and "dry" ends of the Saran microsphere dry foamer in 684 Building. From the concentrations measured, no adverse health effects would be anticipated, even for repeated exposures of 8-hours per day. Samples were collected during a period of warm weather when adjacent windows were opened. If this dry foamer is operated during periods of cold weather, when windows are closed and ventilation decreased, excessive exposures to the Saran microspheres monomers could result and additional samples should be collected to reevaluate the exposures at that time.

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