

A Study of Inhalation of Pentachlorophenol by Rats

III. Inhalation Toxicity Study

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INTRODUCTION

During inhalation exposure experiments which were conducted to determine the distribution and excretion of inhaled sodium pentachlorophenate (PCP) in rats,** at least one animal out of a group of 12 died during each experiment. The animals received only a calculated dose of 5-7 mg each. This is considerably lower than the 30 mg/kg intraperitoneal dose as determined in this laboratory (unpublished data) or the 200 mg/kg animal ingested dose reported by DEICHMANN, et al. (1942) resulting in similar approximate 10% fatality. In an effort to determine the toxic dose, a more detailed inhalation toxicity study was carried out.

MATERIALS AND METHODS

All the materials and methods of exposure used were the same as those described in part II of this study (HOBEN, et al. 1975a). The PCP determination is described in part I of this series (HOBEN, et al. 1975b). Seven groups of Sprague Dawley rats, consisting of twelve male animals each, were exposed to the aerosol of PCP. The animals weighed approximately 220 grams and the different exposures lasted from 28 to 44 minutes. The animals received from 10 to 14.5 mg PCP per kg body weight, the dosage being varied by varying the time of exposure.

RESULTS AND DISCUSSION

The amount of aerosolized PCP inhaled was based on the assumption that one rat inhaled 80 ml per minute. Table I and Figure 1 both show the response of the animals to the PCP.

* deceased

** reported in part IV of this study

Table I Toxicity of inhaled PCP for rat

mg Dose per kg body weight	Log Dose per kg body weight	Percentage of Death	Probit no.
10.1	1.0043	33.3	4.57
11.5	1.0607	41.7	4.79
12.7	1.1038	63.6	5.35
13.7	1.1367	66.7	5.43
13.8	1.1399	75.0	5.67
13.7	1.1367	75.0	5.67
14.5	1.1614	83.3	5.96

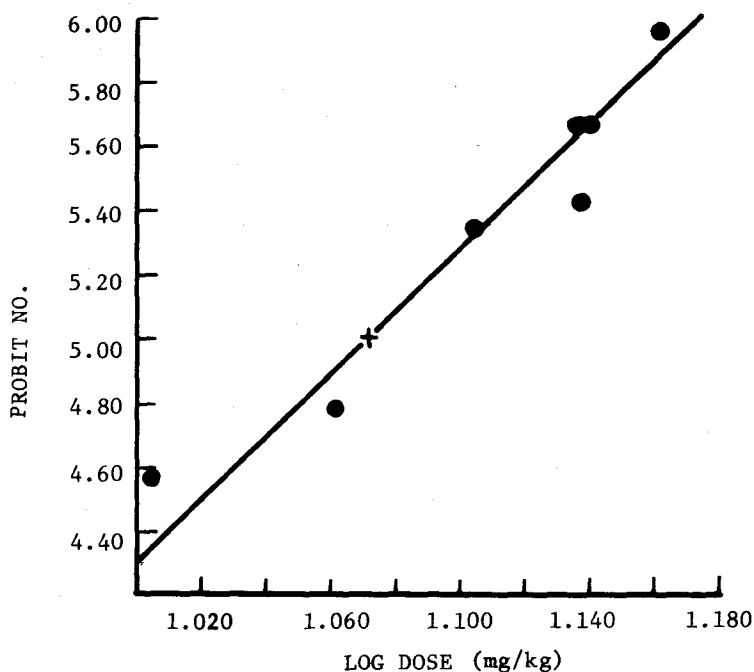


Fig. I Probit curve showing the death rate of rats resulting from inhaled PCP

The LD₅₀ for inhaled aerosol of PCP is 11.7 mg per kg body weight. This is much lower than the ingested dose of 210.6 mg/kg body weight as reported by DEICHMANN, et al. (1942) and the intraperitoneal dose of 34 mg/kg body weight (unpublished data from this lab).

SUMMARY

An LD₅₀ study of inhaled pentachlorophenol has been conducted. Seven groups of rats, consisting of 12 animals each, were exposed to the aerosol of sodium pentachlorophenate. The LD₅₀ was 11.7 mg/kg body weight as shown on a probit curve.

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