

BIO-MEDICAL RESEARCH
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Brief Summary

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R&S 106692

metabolic approach to industrial poisoning: blood kinetics and distribution of ^{14}C -vinylchloride monomer (V.C.M.)

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In order to prevent occupational diseases, metabolic studies permit the use of specialized screening tests. Since the lungs (besides the skin) are one of the most important routes of occupational poisoning, we have developed acute inhalation tests with labelled substances. Blood radioactivity results indicated particular time variations when autoradiographic studies were done and analysed.

Rats were exposed (in total enclosure) for 5 min. in a small glass pilot unit. This thermoregulated inhalation chamber received a dynamic air flow (200 or 400 l/h) into which the VCM was injected (4 l/h). At the exit, congelment methods recovered the waste VCM.

For the blood kinetic studies (5 min. inhalation with 10,000 ppm VCM), a permanent catheter had been implanted in the aortic artery and heparinized blood was regularly collected during the 5 min. inhalation period and also during 90 min. later. The data plotted on a diagram showed particular time variations, which were chosen for autoradiographic studies. New rats have been exposed (5 min. inhalation with 20,000 ppm V.C.M.), and 10, 20, 60, 120, 180 min. later anesthetized and then frozen (liquid nitrogen). Using a cryomicrotome, 20 microns whole-body sections were collected on adhesive tape, desiccated and applied on Kodak films for 21 days. After development, autoradiographs were obtained.

At 10 min. the liver, bile duct, digestive lumen and kidneys contained radioactivity. Later the amount and the distribution of labelled substances (probably both V.C.M. and its metabolites) increased. The urinary system, salivary and lacrimal glands, liver, skin and thymus contained a great deal of labelled molecules.

Inhaled V.C.M. is rapidly absorbed through the lungs and immediately accumulated in the liver. Observation of autoradiographs confirms an urinary excretion and probably indicates bile excretion.

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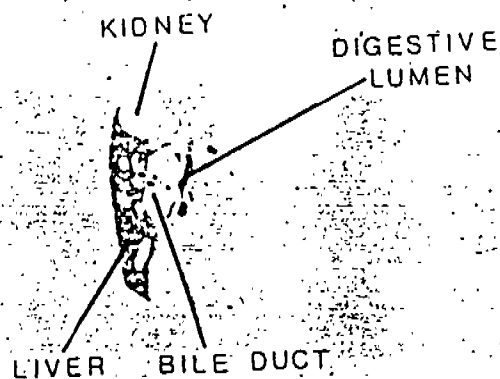
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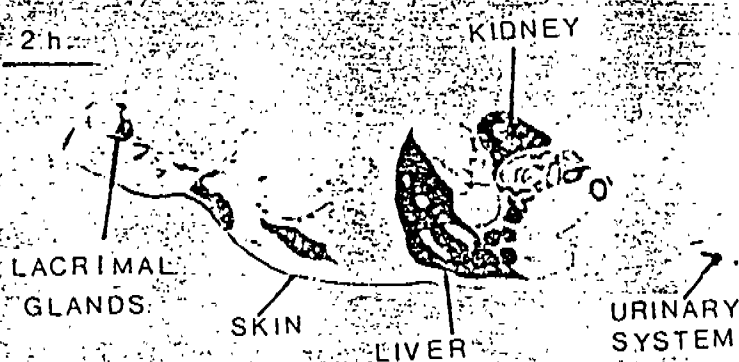
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WHOLE BODY AUTORADIOGRAMS OF MALE RATS AFTER INHALATION OF
¹⁴C-VINYLCHLORIDE MONOMER

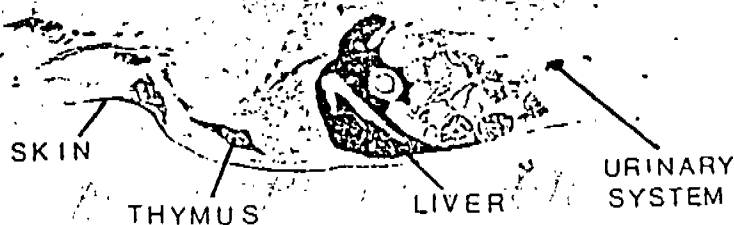
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