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AR 226 - 3467

ORGANIC FLUOROCOMPOUNDS IN BLOOD

In May, 1978, 3M informed Du Pont of findings of organic fluorocompounds in blood of employees exposed to long-chain perfluoro-surface active materials. 3M reported airborne contaminant levels up to 81 ppm in their operations and organic fluorine blood levels of 1 to 71 ppm for exposed workers. 3M reports that some level of organic fluorine in humans is normal, i.e. equal to or less than 1 ppm.

Chambers Works makes functional equivalents to the 3M fluorosurfactants and plant employees were informed of the 3M findings in June 1978. Also a program was initiated to define exposure potential in the Chambers Works fluorocompound manufacturing and use operations, review the medical records of employees assigned to these operations, determine organic fluorine levels in the blood of such employees and to gather additional toxicity information on selected plant fluorocompounds. Program results are summarized below:

- Airborne contaminant monitoring results show that the highest potential for employee fluorocompound exposure to be in the manufacturing facilities. Eight hour time weighted average measurements ranged from <0.3 ppm (5 mg/m³) to 2 ppm (40 mg/m³). The drumming, dedrumming and sampling operations are major contributors to exposures above 0.3 ppm. Engineering control programs to reduce contaminant emissions from these sources is underway.
- Blood samples were taken from a representative sample of exposed employees and analyzed for organic fluorine. The mean organic fluorine value for Chambers Works employees was slightly higher than the Wilmington control group (0.15 ppm versus 0.094 ppm) but all values for exposed employees were less than 1 ppm. This program has been discontinued.
- A review and comparison of the medical records of active fluorocompound exposed plant employees with a control group showed no adverse health effects. However, while the difference is not statistically significant, the number of employees with abnormal liver function tests was notably higher in the exposed group (6 compared to 1). Medical surveillance will be continued with study update December, 1979.

10-day subacute feeding tests carried out by Haskell showed compound related non-reversible effects for three of the eight fluorocompounds tested. Non-reversible liver and testes effects were noted in rats fed 4,470 mg/kg/day [REDACTED] and 850 mg/kg/day [REDACTED]. Decreased sperm production was found in rats fed 5,000 mg/kg/day [REDACTED]. The need for further toxicity testing is being studied.

A meeting is being arranged through Haskell Laboratory to inform 3M of the results of our program.

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