



DOW CHEMICAL U.S.A.

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In January 1981, LHC III had two different pyrolysis gasoline spills. The first spill was contained in the rain water pit, and the second in the ditch beside LHC II. The pyrolysis gasoline was pumped off the top of the water, transferred to a small bullet tank and then transferred back into the process. All personnel (47) working on the clean up wore protective clothing and respirator protection. The respirators used were Comfo II manufactured by Mine Safety Appliances Co. with the MSA GMC type chemical cartridge for acid gases and/or organic vapors.

Potential exposure to the benzene and toluene vapors was monitored by collecting urine samples for phenol analysis from each person before and after the exposure. The urine samples were sent to an independent laboratory for analysis. In addition to the urinary phenol analysis, the employees were sent to Medical for a red and white blood cell count.

The level of potential exposure was measured by having each person wear a 3M 3500 organic vapor monitor. The monitors contained activated carbon which absorbed the contaminate in the atmosphere at a known sampling rate. The volume of the sampling is a product of the sampling rate and the length of the sampling period. The weight of the contaminant (benzene-toluene) collected by the monitor was determined by desorbing the contaminant in carbon bisulfide, then with gas chromatographic techniques, the weight of contaminant in the solvent (CS₂) was determined. The time weighted average (TWA) concentration of the contaminant (benzene-toluene) was determined by measuring the weight of contaminant in a known volume.

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Conclusion:

Report from Medical on the blood counts and the urinary phenols clearly indicates that no one was exposed to the high level of benzene found by the 3M monitors, which leads one to believe the double cartridge respirators are the right ones to use for the clean up of pyrolysis gasoline spills.

The 3M monitors are simple to use and they have proven to be reliable indicators of benzene exposure at low levels, however, from samples 2, 6, 8, 2-2, and 2-6 one might conclude that the adsorption takes place in the first couple of hours at a faster rate than when the monitors are worn all day.

The 3M literature recommends exposure limits of 3000 ppm, or less. This indicates that, at the level of benzene and toluene we found, the monitors should have been effective for the full 12 hours. Next time I will run the same controls and change the monitors more frequently.

It is suspected that samples 20 and 21 on Jan. 21, 1981 were contaminated by the liquid pyrolysis gasoline.

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