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- exposure of employees in the unit. TWA values ranging from a low of 9 ppm to a high of 167 ppm by volume vinyl chloride have been recorded on personnel in the unit. The method is being prepared for publication in Volume 38C of the Laboratory Manual.

910A13 Vinyl Chloride Monitoring (G. F. Hurley)

A MIRAN I (Wilks Scientific Corp.) Infrared Analyzer is being used for continuously monitoring for vinyl chloride in the dispersion vinyl resins unit at the South Charleston plant.

The MIRAN I is a portable single beam analyzer with a variable path gas sample cell. Any gaseous material having infrared absorption can be detected and determined if an absorption band free of interference can be found. Because the optical path can be varied from three-quarters to over 20 meters the sensitivity range of the instrument can vary from a few percent to parts per million. For vinyl chloride the MIRAN I has a claimed sensitivity of 0.7 ppm. For plant monitoring this would probably be on the order of 2 to 4 ppm.

A calibration curve for vinyl chloride in the range of 10 to 350 ppm was drawn based on known concentrations of vinyl chloride in air prepared in static systems. At the wavelength chosen, 10.7μ , moisture, at least at the 50 percent relative humidity level, does not interfere in the analysis.

The instrument is equipped with a pump to enable one to pull samples to the instrument from remote areas. A laboratory test showed no loss of vinyl chloride occurring when 100 feet of half inch O.D. polyethylene tubing was used to draw in sample.

The MIRAN instrument with output signal attached to a strip chart recorder was placed in the control room at the dispersion vinyl resins unit (Building 190) at South Charleston on March 12. After some refinements to the sampling system to provide for on site calibration and scale adjustment, continuous monitoring of vinyl chloride was started with the sampling probe in a walkway in the second level of the unit structure.

The average concentration of vinyl chloride was about 8 ppm through the period March 14 and 15. This was in agreement with samples analyzed by gas chromatography which gave an average 6 ppm. Brief excursions above 300 ppm were noted which followed releases of the monomer during unit process operations. Spot samples taken during the period and analyzed by gas chromatography showed good agreement with the IR results.

The only problem encountered to date, drifting of the scale transmission setting, will be taken care of by periodic re-adjustment. Unit personnel, with guidance from R/D Industrial Hygiene, will maintain the system and move the probe to various reachable areas over the next several weeks to obtain data on the vinyl chloride concentrations.

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