898 A Sampling Anomaly in the Determination of Atmospheric Sulfate Concentration. R.E. Lee, Jr., and J. Wagman. Am. Ind. Hyg. Assn. J. 27, 266-271 (May-June, 1966).

Average particulate sulfate concentrations in air as measured from serial short-term samples collected on glass-fiber filters were consistently and significantly higher than those from single long-term samples. In investigating this anomaly, the authors found that significant amounts of extraneous sulfate can be formed on glass-fiber filters, presumably by oxidation of atmospheric sulfur dioxide, thus leading to highly inflated values for particulate sulfate as determined from short-term samples. The discrepancy is reduced with longer-term samples because the formation of sulfate from sulfur dioxide is surface-limited and reaches a saturation level. Four references are given. -- Authors' abst.

899 Dynamic Calibration of an Acid Aerosol Analyzer. F.P. Scaringelli, R.E. Boone, and G.A. Jutze. J. Air Poll. Control Assn. 16, 310-313 (June, 1966).

A method is described for dynamic calibration of an acid aerosol analyzer based on a commercial modification of the Thomas Autometer and manufactured by the Instrument Development Company. This automated instrument removes acid aerosol from an air stream by sonic impaction, and the sulfuric acid collected is determined conductometrically. An all-glass aerosol generator based on the reaction of water vapor with sulfur trioxide vapor released from fuming sulfuric acid was built for the calibration. Air samples were withdrawn for instrument calibration before and after the concentration of the acid aerosol was determined by titration. The apparent particle size as determined by an Andersen sampler ranged from 2.0 microns to less than 0.68 micron and exhibited a sharp peak with mass median diameter at 1.3 micron in the distribution curve. The size of the aerosol, within certain limits, could be controlled by humidity. Data indicated a linear response with an aerosol collection efficiency of 80% in the important respirable size range. -- Authors' abst.

900 Quantitative Determination of Formaldehyde in Gross Impure Mixtures Containing Other Carbonyl Compounds. R.E. Leonard and J.E. Kiefer. J. Gas Chromatog. 4, 142-143 (April, 1966).

The increasingly important role of low-boiling carbonyl compounds in the studies of air pollution, vegetable flavoring, cigarette smoke and other gross impure mixtures has emphasized the need for determining these compounds in trace quantities. A new gas chromatographic method for the quantitative determination of formaldehyde is described. It is based on the fact that the relationship of peak height to concentration is linear over a wide range of concentrations for the 2,4-dinitrophenylhydrazone derivative. The method is useful for determining trace amounts of formaldehyde in a gross impure mixture containing low-boiling carbonyl compounds.
-- APCA Absts.

PREVENTIVE ENGINEERING

901 Safe Handling and Use of Ethylene Oxide. F.S. Hill, Jr. J. Am. Soc. Safety Eng. 11, 11-16 (Aug. 1966).

Safety considerations in the design and operation of a plant using ethylene oxide as a raw material are decribed in various references in the literature. Most of these references, although very excellent, provide only partial consideration of this problem. This paper is an effort to present a concise, yet complete set of guidelines for handling and use of this large volume organic chemical The safe use of ethylene oxide is predicated to a large degree upon the engineering and operating skill of personnel. It is dependent upon the observance of safety precautions and adherence to operating and design conditions. The greatest single factor from the standpoint of continuous successful operation over a period of years, however, is thought to be thorough preventative plant maintenance of all equipment, instruments, and accessories. The vigorous application of the following principles of safety control should provide a reliable operation for those using ethylene oxide: Provide equipment and safety accessories that conform to specifications of accepted code authorities. Isolate ethylene oxide operations and eliminate sources of ignition in this area. Outdoor installations are recommended using fire resisting construction with pressurized ventilation and adequate explosion venting for control houses. Avoid explosive mixtures inside all equipment by use of inert gas, and proper control of temperature and pressure. Regularly test and inspect all equipment, instruments, and piping. Corrosion on outside of refrigerated vessels and piping can be serious. Provide diked tank areas, adequate drainage, automatic sprinklers, fire alarms, and sprinkler systems for all storage tank and processing equipment. Educate personnel as to the hazards of ethylene oxide and thoroughly train operators with specific job instructions for processing, handling, and storage of ethylene oxide. Establish