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Development of Colorimetric Indicators: A New Technique to Determine Glutaraldehyde and Alkaline Glutaraldehyde Contamination

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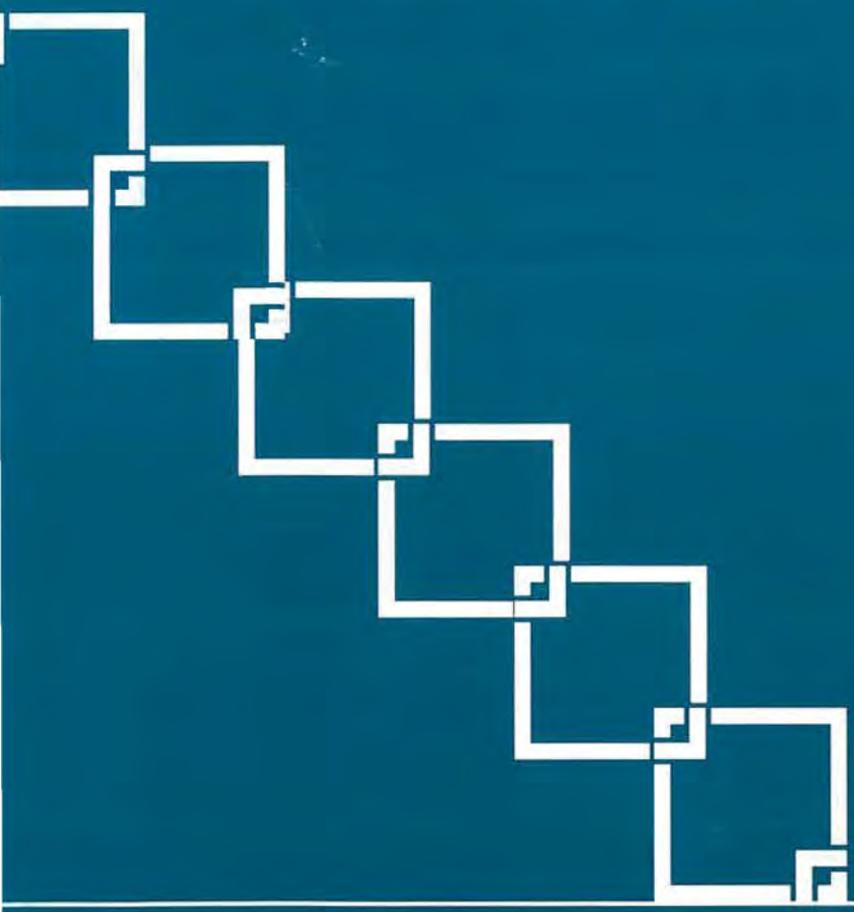
The aim of the study was to investigate a new indicator sensor pad for detection of glutaraldehyde permeation of chemical protective gloves. The pad carries a reagent which responds to glutaraldehyde contaminant by producing a color change. Some commonly used glutaraldehyde and alkaline glutaraldehyde solutions, Metricide, Cetylcode-G, and 50% glutaraldehyde solution, were analyzed by solvent desorption and gas chromatography. All glutaraldehyde solutions exhibited >98% adsorption on the pads over the spiking range 0.05-5.0 mL. Recovery for each glutaraldehyde solution was calculated, ranging from 58-92% (RSD \leq 4.0%) for all glutaraldehyde solutions. Breakthrough times for two protective glove materials (PVC and polymerized alkene) were determined using the Thermo-Hand Method, and found to range from 76 to 150 min for Metricide, from 170 to 230 min for Cetylcode-G, and from 232 to 300 min for 50% glutaraldehyde. The quantitative mass of the glutaraldehyde solutions on the pads at the time of breakthrough detection ranged from 35-37, 37-39, and 38-40 mg/cm² for Metricide, Cetylcode-G, and 50% glutaraldehyde, respectively. The new aldehyde indicator pad should find utility in detecting, collecting, and quantitative analyzing glutaraldehyde and alkaline glutaraldehyde permeation samples in the workplace.

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