

Glutaraldehyde-Based Microbiocides Environmental Fate Studies

Introduction

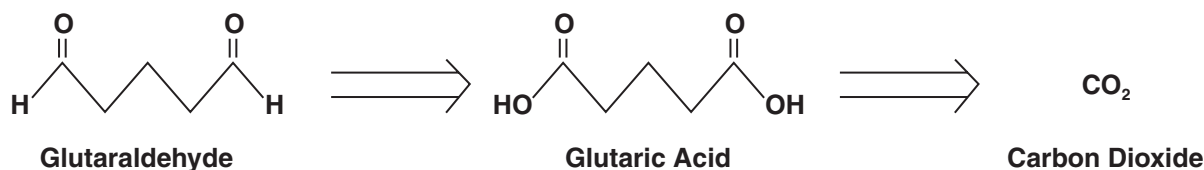
Studies were undertaken to determine the environmental fate of glutaraldehyde, the active ingredient in a variety of antimicrobial products. The purpose of these studies was to determine the products formed when glutaraldehyde is allowed to degrade in the presence of river water and sediment. Both aerobic and anaerobic conditions were employed in determining the fate of glutaraldehyde.

Glutaraldehyde Metabolizes Completely in Aerobic and Anaerobic Systems

Aerobic System

Glutaraldehyde had a half-life of approximately 12 hours. During this period, the glutaraldehyde was metabolized first to glutaric acid and then to carbon dioxide (Scheme 1). No traces of either glutaraldehyde or glutaric acid were found after 48 hours.

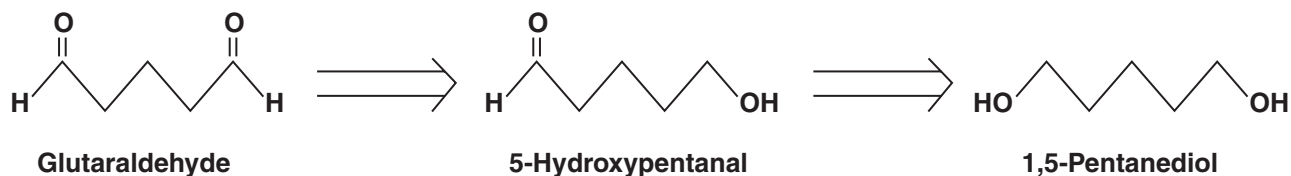
Scheme 1



Anaerobic System

The glutaraldehyde concentration also decreased rapidly in the water and was completely metabolized in three days, with 95 percent degraded in the first 24 hours. The intermediate metabolite in the anaerobic study was 5-hydroxypentanal, which was further metabolized within seven days to 1,5-pentanediol (Scheme 2). This compound has no appreciable biocidal properties.

Scheme 2



Conclusion

Glutaraldehyde is not persistent under aerobic or anaerobic conditions of aquatic soil metabolism.

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