Session 5
Environmental Biotechnology

0273-2289/95/5152—0623$04.20

Introduction to Session 5

Environmental Biotechnology

JAMES N. PETERSEN[1] AND FREDERICK COLWELL[2]

[1]Chemical Engineering Department, Washington State University, Pullman, WA 99164-2710; and [2]Idaho National Engineering Laboratory, Idaho Falls, ID 83401

The development of technologies that can be used to economically clean up contaminated sites and/or to reduce or eliminate waste components from process effluent streams is one of the most important challenges facing this generation. To accomplish such cleanup operations, a variety of solutions is being developed. Of this set of technologies, one of the most promising is based on the use of biological systems to destroy hazardous or toxic materials. Many compounds, including simple hydrocarbons such as gasoline or diesel fuel, are relatively easy to destroy with biologically based technologies. However, the development and successful deployment of biologically based systems for the destruction of more complex and intractable hazardous organics, such as halogenated or polyaromatic compounds, have proven to be more difficult.

The first two papers presented in this session deal with the successful deployment of such technologies in field demonstrations. The first of these deals with the biological destruction of explosives under anaerobic conditions, while the second concentrates on the microbial destruction of trichloroethylene and focuses on the observed effects of nutrients, in particular nitrogen and phosphorous, on the destruction processes.

The next three papers deal with processing systems and the conditions employed to accomplish the destruction or conversion of waste materials. In the first, a new technology that allows aromatic compounds to be enzymatically polymerized to useful products is described. The next paper describes biological removal of sulfidic caustic compounds from refinery waste streams. The final paper in this group describes a system in use in Japan that employees algae to fix CO_2 in a boiler flue gas stream.

In the final paper of the session, the effect of residual NAPL on the migration of PCP in soils is described. The information presented in this paper has significant implications for *in situ* remediation of PCP.