

Introduction

The need for improved test methods relating to disposal, treatment, and characterization of hazardous and industrial solid wastes continues, despite considerable progress since the first ASTM symposium on this subject in 1981. Methods are required to

- Characterize and analyze solid wastes in terms of potential hazards and factors that affect selection of treatment and disposal options.
- Evaluate treatment and disposal processes and operations in terms of efficacy in accomplishing the intended result.
- Assess existing sites to ascertain the need for corrective action and point to alternatives for such action.

This Special Technical Publication (STP) is the sixth volume of test methods developed by ASTM toward fulfilling the above needs. The other ASTM STPs on solid waste testing containing papers from other symposia are listed below, along with locations and the dates of the symposia.

STP 760: Fort Lauderdale, Florida, 14–15 Jan. 1981.

STP 805: Lake Buena Vista, Florida, 28–29 Jan. 1982.

STP 851: Philadelphia, Pennsylvania, 7–10 March 1983.

STP 886: Arlington, Virginia, 2–4 May 1984.

STP 925: New Orleans, Louisiana, 8–9 May 1986.

Test methods for this publication were selected from two ASTM symposia held in 1985, one in Alexandria, Egypt, and one in Colorado Springs. About one-third of the presented papers were selected; they underwent peer review and often extensive revision before publication.

ASTM Committee D-34 on Waste Disposal sponsors a symposium each year on “Industrial and Hazardous Wastes.” Usually, every other year, ASTM opens this symposium to papers from the international scientific community and alternates the location of these international symposia between the United States and various other host countries. Committee D-34’s Third International Symposium was held 24 through 27 June 1985, in Alexandria, Egypt. It was cosponsored by Alexandria University and the U.S. Environmental Protection Agency.

At this international symposium, 104 papers were presented, and it was attended by over 350 experts from 35 countries. This volume contains 25 of the papers that deal with solid waste issues. Twenty-five other papers dealing

with liquid waste treatment were published by the United Nations Economic and Social Commission for Western Asia in a publication entitled *Management of Industrial and Hazardous Waste*, dated Dec. 1985.

Nine papers presented at a D-34 "mini-symposium" in Colorado Springs, 8 and 9 May 1985, entitled "ASTM Environmental Test Method Development" are also contained in this volume. These papers concern the work of Committee D-34 in developing test methods and specifications for environmental monitoring and waste analyses.

It is the objective of these symposia to stimulate research and provide a forum for the exchange of new information and ideas on the management of hazardous and industrial waste. The Alexandria symposium was no exception and, in fact, provided some of the most relevant work to have been exchanged in an international forum in many years. The papers selected for publication covered seven different subject areas: (1) contaminant and leaching assessments, (2) ground water and contaminant migration assessments, (3) incineration of hazardous waste, (4) liner assessments, (5) site monitoring and assessments, (6) waste testing, (7) waste treatment alternatives. ASTM test method development papers came from the Colorado Springs symposium.

For the various papers presented, it is interesting to note differences apparent in the environmental research effort and environmental direction of developing and developed countries. The major emphasis in developed countries has switched from treatment of gaseous emissions, water, and wastewater to treatment and disposal of solid wastes and remediation of waste disposal areas. Developing countries, on the other hand, seem to be placing more emphasis on municipal wastewater and advanced industrial wastewater treatment processes. This is not to say that either group does not or is not striving to make improvements in all areas.

This progression can be traced in the United States from the post-war era of the 1940s, 50s, and 60s, in which a large industrial growth took place to meet the demands of a country emerging from a depression and world war. People were demanding more consumer goods, and little attention was being given to protecting the environment. By the end of the 1960s, the United States was experiencing a very high standard of living, and the people were realizing that the life they were working so hard to improve was at the same time suffering from significant environmental neglect. This awareness gave rise to Earth Days in the late 1960s and a push for environmental laws and regulations. These laws and regulations were focused on controlling and improving air emissions and water discharges. There was a large push for more research in these areas, and many significant technological advances were made.

From this point, it was a logical progression to the development of hazardous waste control. Improvements in air and water treatment technologies

brought about increased industrial solid waste disposal problems. Industrial treatment sludges, along with an array of other industrial and hazardous wastes, were being indiscriminately dumped and subsequently leached back into the environment through poor and improper disposal practices. The public's fear over this situation was heightened by the well publicized problems at such places as Love Canal, Valley of the Drums, and Lipari Landfill.

In response to this environmental contamination and the massive citizen unrest, fear, and outcry over these revelations, EPA issued one of the most comprehensive and technically complex set of regulations related to solid wastes ever promulgated. States soon followed with similar regulation packages that were in many cases even more comprehensive and inclusive than the federal regulations.

Today, as a consequence of these regulations, there is a very serious shortage of disposal sites throughout the United States. The single, clearest, most often expressed citizen view on waste management is that we must find alternatives to landfills. Industry is responding with improved waste management practices, substituting hazardous substances used with less toxic ones, better in-plant control of production lines to reduce waste volume, recycling, reclaiming, and reusing many wastes previously discarded, and by improving methods for treatment and detoxifying wastes. Although there is a long way to go, significant strides have been made by industry and government in meeting this challenge.

Many developing countries have also realized the importance of maintaining the integrity of our environment as evidenced by a sincere interest in information exchanges such as international symposia, the research in progress, and by their information of environmental commissions, ministries, and other governmental agencies. It is possible that these developing countries will undergo the same sort of metamorphosis that developed countries are now experiencing as the people realize how real a threat industrial expansion without adequate environmental controls can be to a nation's health, environment, and future.

Industrial expansion is essential to both developing and developed countries to compete or maintain their place in the world markets and improve their standard of living. With world-wide industrial expansion comes not only intra-country environmental stress but intercountry and global stress as well. To solve this very real world-wide threat, all countries must work together in controlling waste generation, treatment, and disposal. International commissions should be organized to ensure appropriate standards among all nations and to encourage and pressure those who are reluctant to respond.

Committee D-34 thanks Alexandria University, the Egyptian Government, and all participants in the Third International Symposium on Industrial Hazardous Waste for furthering this cause for international cooperation in solving this very complex and important issue.

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