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## Foreword

Treatment technologies for corrosive-containing wastes are described in this book, which will be a comprehensive source of information for those involved in the evaluation of available waste management options.

Corrosive acids and alkalis are widely used by all segments of American industry and result in the generation of approximately 40% of all Resource Conservation and Recovery Act (RCRA)-regulated hazardous wastes. Improper management of these wastes can result in altered pH of surface waters to the detriment of aquatic organisms. Land disposal of these wastes can also lead to the solubilization of toxic (e.g., heavy metal) constituents of codisposed wastes, thereby enhancing the potential for their transport into the environment. To combat the potential negative effects associated with current disposal practices, the 1984 RCRA Amendments directed EPA to ban corrosive wastes from land disposal to the extent required to protect human health and the environment.

The land disposal ban excludes acidic corrosive wastes (pH less than or equal to 2.0) from land disposal units (excluding underground injection), effective July 8, 1987. Treatment standards for corrosives which are currently managed through underground injection were to be promulgated on August 8, 1988. Finally, alkaline corrosive wastes (pH greater than 12.5) will be banned from disposal effective May 8, 1990. In addition, standards for hazardous constituents which are commonly present in corrosive wastes, such as heavy metals and toxic organics, are also being promulgated under the 1984 RCRA Amendments. Thus, prior to land disposal, corrosive wastes will also have to meet these standards as they are promulgated.

All potentially viable technologies for treating corrosive-containing wastes are identified and discussed in the book; however, emphasis is placed on proven technologies. Each of the technologies is described in terms of actual performance in removing constituents of concern, associated process residuals and emissions, and those restrictive waste characteristics impacting the ability of a particular technology to effectively treat the wastes under consideration. Cost and capacity data are also provided to help assess the applicability of the technologies to specific waste streams.

The information in the book is from *Technical Resource Document: Treatment Technologies for Corrosive-Containing Wastes*, prepared by L. Wilk, S. Palmer, and M. Breton of Alliance Technologies Corporation for the U.S. Environmental Protection Agency, December 1987.

# Contents and Subject Index

1. INTRODUCTION . . . . .	1
Purpose and Scope . . . . .	3
Document Organization and Content . . . . .	3
2. IDENTIFICATION OF RCRA CORROSIVE WASTES . . . . .	5
References . . . . .	13
3. CORROSIVE WASTE SOURCES, GENERATION, AND MANAGEMENT . . . . .	14
Corrosive Waste Sources . . . . .	14
Chemicals and Allied Products . . . . .	16
Inorganic Chemicals Industry . . . . .	16
Fertilizer Industry . . . . .	18
Organic Chemicals Industry . . . . .	18
Petroleum Refining Industry . . . . .	22
Primary and Secondary Metals Industry . . . . .	23
Fabricated Metals, Machinery, Electrical Supplies and Transportation Equipment . . . . .	27
Electric Utilities . . . . .	33
Other Industries Which Generate Corrosive Wastes . . . . .	35
RCRA Corrosive Waste Generation and Management . . . . .	37
Corrosive Waste Generation Estimates . . . . .	38
Corrosive Waste Management Practices . . . . .	41
Corrosive Waste Generation by Industrial Classification (SIC) . . . . .	42
Recent Changes in Corrosive Waste Generation . . . . .	46
Corrosive Waste Characteristics Summary . . . . .	47
References . . . . .	50
4. NEUTRALIZATION TREATMENT TECHNOLOGIES . . . . .	53
General Considerations . . . . .	54
Acid Base Theory . . . . .	54
Reagent Selection . . . . .	56
Pretreatment Requirements . . . . .	59
General Neutralization Processing Equipment . . . . .	62
Neutralization System . . . . .	63
Post-Treatment . . . . .	65
Treatment Trains . . . . .	66

Clarification and Sludge Consolidation . . . . .	70
Land Disposal of Residuals . . . . .	80
Cement Based Systems . . . . .	84
Lime Based (Pozzolanic) Techniques . . . . .	87
Thermoplastic Material . . . . .	87
Organic Polymers (Thermosets) . . . . .	87
References . . . . .	90
<b>Mixing of Acid and Alkali Wastes . . . . .</b>	<b>92</b>
Process Description . . . . .	92
Process Performance . . . . .	95
Process Costs . . . . .	98
Process Status . . . . .	104
References . . . . .	107
<b>Limestone Treatment . . . . .</b>	<b>108</b>
Process Description . . . . .	108
Process Performance . . . . .	114
Process Costs . . . . .	120
Process Status . . . . .	126
References . . . . .	127
<b>Lime Slurry Treatment . . . . .</b>	<b>128</b>
Process Description . . . . .	128
Lime Slurry . . . . .	128
Waste Carbide Lime . . . . .	133
Cement Kiln Dust . . . . .	135
Process Performance . . . . .	137
Process Costs . . . . .	142
Process Status . . . . .	147
References . . . . .	149
<b>Caustic Soda Treatment . . . . .</b>	<b>151</b>
Process Description . . . . .	151
Process Performance . . . . .	158
Process Costs . . . . .	162
Process Status . . . . .	162
References . . . . .	168
<b>Mineral Acid Treatment . . . . .</b>	<b>169</b>
Process Description . . . . .	169
Process Performance . . . . .	173
Process Costs . . . . .	180
Process Status . . . . .	184
References . . . . .	188
<b>Carbonic Acid Treatment . . . . .</b>	<b>189</b>
Process Description . . . . .	189
Process Performance . . . . .	193
Process Costs . . . . .	196
Process Status . . . . .	201
References . . . . .	203
<b>5. RECOVERY/REUSE TECHNOLOGIES . . . . .</b>	<b>204</b>
<b>Introduction . . . . .</b>	<b>204</b>
<b>Evaporation and Distillation . . . . .</b>	<b>206</b>
Process Description . . . . .	206
Operating Parameters . . . . .	212
Pretreatment . . . . .	216
Post-Treatment . . . . .	217

Process Performance . . . . .	217
Process Costs . . . . .	223
Process Status. . . . .	227
References . . . . .	229
<b>Crystallization . . . . .</b>	<b>231</b>
Process Description . . . . .	231
Operating Parameters . . . . .	236
Pretreatment Requirements. . . . .	240
Post-Treatment Requirements . . . . .	240
Process Performance . . . . .	242
Costs. . . . .	242
Process Status. . . . .	245
References. . . . .	248
<b>Ion Exchange . . . . .</b>	<b>250</b>
Process Description . . . . .	250
Operating and Design Parameters . . . . .	257
Pretreatment Requirements/Restrictive Waste Characteristics. . . . .	260
Post-Treatment Requirements . . . . .	261
Process Performance . . . . .	261
Process Costs . . . . .	275
Process Status. . . . .	277
References. . . . .	285
<b>Electrodialysis . . . . .</b>	<b>287</b>
Process Description . . . . .	287
Operating Parameters. . . . .	290
Pre-Treatment Requirements/Restrictive Waste Characteristics. . . . .	290
Post-Treatment Requirements . . . . .	292
Process Performance . . . . .	292
Costs. . . . .	307
Process Status. . . . .	311
References. . . . .	316
<b>Reverse Osmosis . . . . .</b>	<b>318</b>
Process Description . . . . .	318
Operating Parameters. . . . .	321
Pretreatment Requirements/Restrictive Waste Characteristics. . . . .	323
Post-Treatment . . . . .	324
Process Performance . . . . .	324
Process Costs . . . . .	331
Process Status. . . . .	334
References. . . . .	339
<b>Donnan Dialysis and Coupled Transport . . . . .</b>	<b>341</b>
Process Description . . . . .	341
Operating Parameters. . . . .	343
Pretreatment . . . . .	347
Post-Treatment. . . . .	347
Process Performance . . . . .	348
Donnan Dialysis . . . . .	348
Coupled Transport. . . . .	352
Process Costs . . . . .	353
Process Status. . . . .	354
References. . . . .	355
<b>Solvent Extraction. . . . .</b>	<b>356</b>
Process Description . . . . .	356
Operating Parameters. . . . .	362

x Contents and Subject Index

Pretreatment . . . . .	369
Post-Treatment . . . . .	369
Process Performance . . . . .	372
Process Costs . . . . .	378
Process Status . . . . .	378
References . . . . .	379
<b>Thermal Decomposition . . . . .</b>	<b>380</b>
Process Description . . . . .	380
Operating Parameters . . . . .	383
Process Performance . . . . .	386
Process Costs . . . . .	389
Process Status . . . . .	389
References . . . . .	394
<b>Waste Exchange . . . . .</b>	<b>396</b>
Description . . . . .	398
Application . . . . .	398
Costs . . . . .	400
Status . . . . .	403
References . . . . .	404
<b>6. CONSIDERATIONS FOR SYSTEM SELECTION . . . . .</b>	<b>408</b>
<b>General Considerations . . . . .</b>	<b>410</b>
<b>Waste Management Process Selection . . . . .</b>	<b>410</b>
Waste Characterization . . . . .	412
Source Reduction Potential . . . . .	413
Waste Exchange Potential . . . . .	414
Recovery Potential . . . . .	415
Identifying Potential Treatment and Disposal Options . . . . .	415
Availability of Potential Management Options . . . . .	416
Management System Cost Estimation . . . . .	421
Modeling System Performance and Pilot-Scale Testing . . . . .	423
<b>References . . . . .</b>	<b>423</b>

## PURPOSE AND SCOPE

This Technical Resource Document (TRD) for corrosive RCRA wastes identifies recovery and treatment alternatives to land disposal for these wastes and provides performance data and other technical information needed to assess potentially applicable alternatives. This document is one of a series of documents designed to assist regulatory agency and industrial personnel in meeting the land disposal restrictions promulgated by the 1984 RCRA Amendments. To minimize redundancy, emphasis has been placed on treatment technologies (i.e., neutralization) which specifically address the corrosive nature of RCRA wastes. Similarly, discussion of recovery practices has been restricted to methods which are capable of achieving adequate performance at extreme conditions of pH. Although emphasis is placed on performance data for these processes, cost data and technical factors affecting performance (e.g., restrictive waste characteristics) are discussed to assist in the evaluation of alternative approaches to land disposal.

## DOCUMENT ORGANIZATION AND CONTENT

The following section (Section 2) will identify the hazardous wastes of concern which meet the RCRA definitions of corrosive wastes. Available information concerning waste stream characteristics, generation, and management practices will be provided in Section 3. Following sections (Sections 4 and 5) will discuss neutralization and recovery practices, which are available as alternatives to land disposal. Each process will be reviewed with regard to the following four factors:

1. Process description, including design and operating parameters, applicable waste types, pretreatment requirements, and post-treatment and disposal of residuals;
2. Case study and performance data which identifies the range in potential applications, processing equipment, and system configurations;
3. Cost of treatment; and
4. Present status of the process.

#### 4 Corrosive-Containing Wastes

Virtually all corrosive wastes will have to undergo some form of neutralization as part of the treatment/disposal process. Thus, handling of non-corrosive waste constituents will be discussed as pre- or post-treatment (neutralization), as appropriate. Treatment and disposal alternatives for these non-corrosive constituents and treatment residuals will be identified. However, the reader is referred to related Technical Resource Departments for detailed performance data since this was beyond the scope of this document.

A final section (Section 6) provides approaches to identifying and selecting appropriate technologies for corrosive waste streams. Although emphasis is placed on technical approaches, economic and institutional concerns are also discussed to assist in process selection.