

CONTENTS

	Page
1 LECLANCHE AND ZINC CHLORIDE CELLS	1
Technical Considerations	5
Materials of Construction	72
Battery Performance	108
The Zinc Chloride System	138
References	140
2 MAGNESIUM CELLS	149
General Considerations	149
Cells with Inert Cathodes	151
The Magnesium Dry Cell	153
Service Characteristics	160
Miscellaneous Systems	162
Systems with High Anodic Efficiency	167
References	168
3 ALUMINUM CELLS	171
Aluminum in Primary Batteries	171
General Considerations	174
The Aluminum: Manganese Dioxide Dry Cell	174
Service Characteristics	179
Current Status and Prospectus	184
References	185
4 ORGANIC CATHODES AND ANODES FOR BATTERIES	187
Factors Limiting Performance of Organic Depolarizers	190
Coulometric Evaluation of Organic Electrode Processes	196
Classification of Organic Electrophores	201
Description of Several Cell Systems Using Organic Electrophores	209
References	235
5 LOW-TEMPERATURE AQUEOUS BATTERY SYSTEMS	239
General Considerations	239
The Modified Leclanche System	241
Structural Features	247
Other Low-Temperature Systems	252
A Comparison of Low-Temperature Systems	256
References	261
6 THERMAL BATTERIES	263
Cell Designs	266
Single Cell Investigations	271
Long-Life Cells	279
Heat-Sensing Thermal Battery	280
Battery Operation	282
References	291
7 WATER-ACTIVATED BATTERIES	295
General Considerations	295
Description of the Battery System	297
Development of Heat in the Activated Battery	307
Construction and Operation	309

	Battery Characteristics	312
	Torpedo Batteries	313
	References	317
8	NOMENCLATURE AND TESTING PROCEDURES FOR PRIMARY BATTERIES	321
	General Considerations	321
	Development of Standard Tests	322
	Nomenclature and Standard Sizes of Dry Cells	324
	General Tests	325
	Electromechanical Procedures in Testing	335
	Special Tests	345
	Tests for Additional Types of Primary Cells	352
	Tests for Wet Primary Cells	353
	References	357
9	REVERSIBILITY OF BATTERY SYSTEMS	369
	Sealed, Maintenance-Free Batteries	371
	Rechargeable Leclanche System	391
	Criteria for Rechargeability	393
	References	427
10	INTERNAL RESISTANCE OF PRIMARY BATTERIES	429
	General Considerations	429
	Measurement Methods	430
	Direct Current Methods	432
	Alternating Current Methods	442
	Discussion	452
	References	460
11	ENERGY CONVERSION	470
	Conversion Mechanisms	470
	Chemical Sources	470
	Solar Sources	472
	Nuclear Sources	479
	Static Thermal Processes	486
	Dynamic Thermal Processes	495
	Mechanical Processes	499
	References	501