



Handbook of Nonferrous Metallurgy

PRINCIPLES AND PROCESSES

PREPARED BY A STAFF OF SPECIALISTS

DONALD M. LIDDELL, Editor-in-chief

Metallurgical Engineer; Formerly Secretary of the Mining and Metallurgical Society of America; Formerly Managing Editor of the Engineering and Mining Journal; Author of "Metallurgists' and Chemists' Handbook"; Editor of "Handbook of Chemical Engineering"; Coauthor of "Principles of Metallurgy"; Coauthor of "Mineral Resources of the United States and Its Capacity to Produce"; Lieutenant-Colonel, Air Reserve (Inactive)



SECOND EDITION

McGRAW-HILL BOOK COMPANY, Inc.

NEW YORK AND LONDON

1945

HANDBOOK OF NONFERROUS
METALLURGY

Edited by

DONALD M. LIDDELL

I. PRINCIPLES AND PROCESSES

II. RECOVERY OF THE METALS

728994

CONTENTS

	PAGE
PREFACE TO THE SECOND EDITION	vii
PREFACE TO THE FIRST EDITION	ix
CHAPTER	
I. INTRODUCTION (Liddell)	1
II. DRYING (Russell)	6
III. CRUSHING AND GRINDING (Hardinge)	18
IV. SAMPLING (Liddell)	60
V. SCREENING (Reed)	89
VI. PART I. CLASSIFICATION (Dorr, Bosqui)	101
PART II. CONCENTRATION (Liddell)	126
PART III. FLOTATION (Swainson)	149
VII. PART I. DEWATERING (Dorr, Bosqui)	167
PART II. FILTRATION (Irvin)	186
VIII. METALLURGICAL FUELS (Liddell)	214
IX. PYROMETRY (Roeser, Van Dusen)	230
X. ROASTING AND SINTERING (Dwight, Rowen)	276
XI. REFRACTORIES (Harvey)	324
XII. SEPARATION OF SOLIDS AND LIQUIDS FROM GASES (Landolt, Viets)	395
XIII. BRIQUETTING APPLIED TO METALLURGY (Stillman, Liddell)	409
XIV. POWER PLANT AND ACCESSORIES (Donaldson)	429
XV. MATERIALS OF METALLURGICAL CONSTRUCTION (Church)	456
XVI. PLANT LAYOUT (Barbour)	575
XVII. THE ELECTRIC FURNACE IN NONFERROUS METALLURGY (Liddell)	583
XVIII. APPLIED ELECTROCHEMISTRY (Fink)	629
INDEX	647

Handbook
1953
659.21.8
1-18
2
3 ed. 1/4

128994

Handbook of Nonferrous Metallurgy

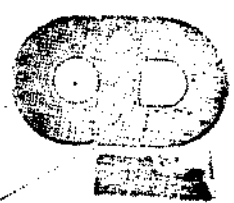
RECOVERY OF THE METALS

15 NOV 1997

PREPARED BY A STAFF OF SPECIALISTS

DONALD M. LIDDELL, Editor-in-chief

Metallurgical Engineer; Formerly Secretary of the Mining and Metallurgical Society of America; Formerly Managing Editor of the Engineering and Mining Journal; Author of "Metallurgists and Chemists' Handbook"; Editor of "Handbook of Chemical Engineering"; Coauthor of "Principles of Metallurgy"; Coauthor of "Mineral Resources of the United States and Its Capacity to Produce"; Lieutenant-Colonel, Air Reserve (Inactive)



SECOND EDITION
FOURTH IMPRESSION

McGRAW-HILL BOOK COMPANY, Inc.
NEW YORK AND LONDON
1945

CONTENTS

	Page
REFRACE TO THE SECOND EDITION.	vii
REFRACE TO THE FIRST EDITION.	ix
CHAPTER	
I. ALUMINUM (Liddell)	1
II. MAGNESIUM (Liddell)	44
BERYLLUM (Liddell)	67
III. THE ALKALI AND ALKALINE EARTH METALS (Loonam)	73
IV. ARSENIC (Smith)	94
V. ANTIMONY (Riddell and Wang)	104
VI. BISMUTH (Smith)	139
VII. LEAD (Bowman)	144
VIII. TREATMENT OF ELECTROLYTIC SLIME AND ZINC CRUST (Jones)	216
IX. METALLURGY OF COPPER (Pyne)	227
X. REFINING OF GOLD AND SILVER BULLION (Wagor)	275
XI. HYDROMETALLURGY OF GOLD AND SILVER (Sharwood)	289
XII. HYDROMETALLURGY OF COPPER (Tobelman)	345
XIII. ELECTROLYTIC REFINING OF LEAD (Reinberg)	370
XIV. THE ELECTROLYTIC ZINC PROCESS (Laist, Caples, and Wever)	379
XV. PYROMETALLURGY OF ZINC (Ingalls)	444
CADMIUM (Ingalls)	469
XVI. MERCURY (Gould)	473
XVII. THE ROLE OF CHLORINE IN METALLURGY (Croasdale)	517
XVIII. CHROMIUM (Perkins)	556
XIX. MANGANESE (Hersam)	566
XX. COBALT (Schaal, Murphy, and Laurich)	583
XXI. NICKEL (Liddell)	593
XXII. FERROALLOY METALS (Doerner)	615
XXIII. RADIUM AND URANIUM (Doerner)	637
XXIV. TIN (Hallett)	656
XXV. MINOR METALS (Liddell)	680
APPENDIX	707
INDEX	711