Symposium on ELECTRON METALLOGRAPHY



Published by the
AMERICAN SOCIETY FOR TESTING MATERIALS
1916 Race St., Philadelphia 3, Pa.

ASTM Special Technical Publication No. 262

SYMPOSIUM ON ELECTRON METALLOGRAPHY

Presented at the SIXTY-SECOND ANNUAL MEETING AMERICAN SOCIETY FOR TESTING MATERIALS Atlantic City, N. J., June 23, 1959



Reg. U.S. Pat. Off.

ASTM Special Technical Publication No. 262

Price \$4.25; to Members \$3.40

Published by the AMERICAN SOCIETY FOR TESTING MATERIALS 1916 Race St., Philadelphia 3, Pa. © By American Society for Testing Materials 1960 Library of Congress Catalog Card Number: 59-15659

FOREWORD

This Symposium on Electron Metallography includes the papers presented at the Technical Session on Electron Metallography held on Tuesday, June 23, 1959, during the Sixty-second Annual Meeting of the Society at Atlantic City, N. J. The session was sponsored by Subcommittee XI on Electron Microstructure of Metals of ASTM Committee E-4 on Metallography.

The papers presented at this session include new techniques and results of research studies in the field of electron metallography during the past year. Also included is the Sixth Progress Report of Subcommittee XI entitled "Electron Microstructure of Precipitation-Hardenable Austenitic and Nickel-Base Alloys."

Not included in this volume is the paper "Composition of γ'^2 Phase in High-Temperature Alloys from Electron Microprobe Measurements," by L. S. Birks and R. E. Seebold, which was an informal presentation not intended for publication.

Mr. N. A. Nielsen, of E. I. du Pont de Nemours and Co., Inc., acted as symposium chairman, and Miss Anna M. Turkalo, of General Electric Co., presided over the session.

Note.—The Society is not responsible, as a body, for the statements and opinions advanced in this publication.

CONTENTS

P.	AGE
Introduction—N. A. Nielsen	1
Electron Microstructure of Precipitation-Hardenable Austenitic and Nickel-Base Alloys—Sixth Progress Report of Subcommittee XI on Electron Microstructure	2
of Metals.	3
Morphology of Phases in High-Temperature Alloys as Revealed by the Electron Microscope—J. R. Mihalisin	23
Simplified Electron Metallography of Steels—G. E. Pellissier	32
Techniques for Studying Structure and Growth of Tin Oxide by Electron Microscopy—P. S. Trozzo	57
Electron Metallography of Neutron-Irradiated Steels-R. F. McCartney and P. S.	
Trozzo	63
Electron Microscopy of Tin Plate—P. A. Stoll	73
Instrument Modification for Routine Electron Diffractometry-G. R. Grieger	77
Structure Analysis with Routine Electron Diffraction—G. R. Grieger	90
A Simple Application of the Carbon Replica Technique—L. Pellier	99
Electron Microscope Observations of Dislocations in Thin Metal Foils—R. M. Fisher and A. Szirmae	103
Microstructure of a Cast Age-Hardenable Nickel-Chromium Alloy—R. F. Decker	
and C. G. Bieber	120

THIS PUBLICATION is one of many issued by the American Society for Testing Materials in connection with its work of promoting knowledge of the properties of materials and developing standard specifications and tests for materials. Much of the data result from the voluntary contributions of many of the country's leading technical authorities from industry, scientific agencies, and government.

Over the years the Society has published many technical symposiums, reports, and special books. These may consist of a series of technical papers, reports by the ASTM technical committees, or compilations of data developed in special Society groups with many organizations cooperating. A list of ASTM publications and information on the work of the Society will be furnished on request.

