

SYMPOSIUM ON ADVANCES IN TECHNIQUES IN ELECTRON METALLOGRAPHY

INTRODUCTION

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This volume represents the broad range of interests that are continuing to develop in the work of Subcommittee XI on Electron Microstructure of Metals of ASTM Committee E-4 on Metallography. Subcommittee XI's activities have broadened considerably in the past several years. At the present time there are three task groups operating in the following areas: (1) Electron Metallography, (2) Electron Probe Microanalysis, and (3) Electron Diffraction. The Electron Diffraction group is the newest addition to the subcommittee's activities and was organized in 1961 with Mr. K. Beu acting as chairman of the group. It was felt by many members of the subcommittee that insufficient attention had been given to this area and Mr. Beu's activities have been directed to overcoming this deficiency; the series of papers on electron diffraction in this volume are a testimonial to his intensive efforts over the past year.

The first paper, by Philibert, concerns a theoretical treatment of the absorption correction which must be made in electron probe analysis of alloys. Absorption effects are, of course, the limiting factor in obtaining quantitative measurements by this technique.

The next three papers should be considered as a set involving the use of

electron diffraction techniques. The papers by Beu and Dorsey deal with the measurement of electron diffraction ring diameters. Although different techniques were used in these measurements, the results are in general agreement. The paper by Sturkey is concerned with electron diffraction intensities and has a particularly valuable discussion of the difficulties involved in the interpretation of "spot" patterns. Included with this set of papers is a discussion of Beu's paper by E. T. Stephenson.

The next three papers are more or less related since they concern the use of thin foil techniques applied to electron microscopy enabling the study of metal structure directly. The paper by Pellier is concerned with the correlation of structures obtained by thin foil techniques with those obtained by replica microscopy. The paper by Melton, Schwartz, and Kiefer concerns a technique for preparing thin foils with a minimum of alteration of the structure. The paper by Glenn and Raley is a careful study of the variables involved in thinning iron-base materials by electrolytic methods for examination in the electron microscope.

The final paper by Fragetta and Mihalisin is a typical example of the use of the electron microscope and its selected area diffraction feature for the interpretation of structures in an alloy by replica techniques.

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