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**ELECTRON
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PREPARATION TECHNIQUES
IN MATERIALS SCIENCE**

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PREFACE

This book consists of a short introduction to the more important transmission electron microscope specimen preparation techniques, together with a comprehensive list of these methods for specific materials taken from the literature up to the end of 1975.

If the material of interest has been prepared before, the method will be found in the tables in section 9 under the appropriate material's heading. Usually several alternatives are listed. It may be necessary to try the full range until a satisfactory result is obtained because the reproducibility of the results appears to vary from one laboratory to another. For an unlisted material, success is usually obtained by using the technique for the material with the closest composition, and varying only slightly parameters such as electrolyte composition, applied electrical potential, ion gun conditions, etc. Sometimes this approach may be unsuccessful for electropolishing. If so, find solutions for the constituent elements and select that with the most common components. However, considerable experimentation with composition of the solution and applied electrical conditions may be necessary before success is obtained. To facilitate this process, a large number of electropolishing solutions are included in section 9.1.

In some cases artefacts may be introduced during specimen preparation. If it is suspected that this is occurring, compare the results of several approaches.

It must be emphasised that serious accidents can happen with mixtures of chemicals, particularly when an electrical potential is applied. Consequently, considerable care must be taken at all times, particularly with the solutions mentioned in section 6. Every effort has been made to give reliable information on safety and first aid. However, neither the authors nor the publishers can assume responsibility for the validity of the precautions or the consequences of their use. The objective has been to point out the dangers and to furnish the best guides available relative to safety.

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