

***Deformation
Mechanisms,
Texture,
and Anisotropy
in Zirconium
and Zircaloy***

Erich Tenckhoff



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DEFORMATION MECHANISMS, TEXTURE, AND ANISOTROPY IN ZIRCONIUM AND ZIRCALOY

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Preface

This book is aimed at students and practicing engineers who wish to extend their knowledge of the effects of deformation mechanisms on both texture formation and mechanical anisotropy. Following a general review of the deformation mechanisms in hexagonal close packed (hcp) metals, the examples of zirconium and Zircaloy (the latter being of technical importance for light water reactor fuel element cladding tubes) are used to illustrate the interactions involved. A clarification of the relationships is of interest to theoreticians, because it contributes to understanding the theory of deformation during texture formation in hcp metals. By allowing for these relationships, it is possible for the practicing engineer to select the texture of zirconium and Zircaloy semifinished products by choosing the appropriate deformation parameters, so they can then be optimally adapted to the operational demands. The knowledge gained can be applied similarly to other hcp metals, if one allows for the metal specific parameters of the hexagonal structure.

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