

Preface

This volume is a collection of papers presented at the International Conference in “Microstructure and Texture in Steels” held in Jamshedpur between 5–7th of February 2008.

Texture and microstructure, besides chemistry, are key factors that control properties of engineering materials. The design of any engineering product needs proper knowledge of these two parameters. Texture and Microstructure evolve during thermo-mechanical processing of materials. These processes constitute the most important steps in product fabrication schedule, especially for steels for automotive application. It is, therefore, quite natural that they should be the subject of intensive research. Hence the theme selected for this international conference was microstructure and texture in steels. This conference was organized jointly by R&D, Tata Steel and the Indian Institute of Metals, Jamshedpur Chapter, on the occasion of centenary celebration of Tata Steel and 70 years of the company’s Research & Development Division.

In recent times, the science of processing of steels has acquired new dimensions. The quest for stronger and more formable steels has led to new approaches towards optimal design of material and components. Effect of steel processing on evolution of texture and microstructure are being studied with renewed interest. In particular, the advent of new techniques such as orientation imaging microscopy, local texture determination by synchrotron radiation and new approaches in modelling and simulation of microstructure and texture have led to deeper understanding of this subject. In this conference, each of these aspects was covered at length by experts in these fields.

This conference also covered new developments such as production of ultra-fine grains or nanostructured materials. Also covered was research on materials other than steels, as they highlighted the mechanisms and use of modern characterisation tools.

The contents of this volume have been structured to suit the convenience of the readers. Papers in the introductory section are on fundamentals of texture and

microstructure of steels. These also include emerging fields such as grain boundary engineering.

The second section deals with topics on applied research on microstructure and texture control in steels. This section includes bulk as well as surface characteristics, such as coating and design of new steels for specialised applications and new concepts of microstructure design.

The third section is dedicated to modelling of texture and microstructure. This is followed by a section on specialized characterisation techniques for microstructure and texture examination.

The next section contains papers on special processes and materials. Some papers on the exotic materials like iron aluminium have also been included.

In addition to the invited papers, this volume also includes papers contributed by research scholars from various countries.

Since materials covered in the book are non-steel as well, the book has been named as 'Texture and Microstructure of steels and other materials'.

We hope that the reader will find in this collection an up-to-date account of current issues, concepts, techniques and thoughts related to the science of texture and microstructure.

We are indebted to all the speakers who had accepted our invitation and have taken the pain of traveling from different parts of the globe to attend and share their knowledge with us. We are thankful to the delegates as well as their sponsoring organisations for showing their interest and to the sponsors of this conference for encouraging the efforts. We are indeed grateful to the Indian Institute of Metals, for jointly organising this conference and to the publishers, Springer Link Pvt. Ltd., for kindly agreeing to publish the proceedings. Last but not the least, thanks to all those who worked in the background to make the conference a great success.

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