



# Solidification and Crystallization Processing in Metals and Alloys

*Hasse Fredriksson, Ulla Akerlind*

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**Solidification and Crystallization Processing in Metals and Alloys**

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Solidification or crystallization occurs when atoms are transformed from the disordered liquid state to the more ordered solid state, and is fundamental to metals processing. Conceived as a companion volume to the earlier works, *Materials Processing during Casting* (2006) and *Physics of Functional Materials* (2008), this book analyzes solidification and crystallization processes in depth.

Starting from the thermodynamic point of view, it gives a complete description, taking into account kinetics and mass transfer, down to the final structure. Importantly, the book shows the relationship between the theory and the experimental results. Topics covered include:

- Fundamentals of thermodynamics
- Properties of interfaces
- Nucleation
- Crystal growth - in vapours, liquids and melts
- Heat transport during solidification processes
- Solidification structures - faceted, dendritic, eutectic and peritectic
- Metallic glasses and amorphous alloy melts

*Solidification and Crystallization Processing in Metals and Alloys* features many solved examples in the text, and exercises (with answers) for students. Intended for Masters and PhD students as well as researchers in Materials Science, Engineering, Chemistry and Metallurgy, it is also a valuable resource for engineers in industry.

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