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Microstructural changes in steels – recent advances in experiments and modelling

The microstructures of steels evolve during processing and determine the properties of these materials, which is a strong motivation to investigate the kinetics of phase transformations, recrystallization and subsequent grain growth both experimentally and by modelling. Models based on the relevant physical principles are a precondition to improve the understanding of microstructure-property relationships. Based on in-situ experiments the evolving microstructures can be subjected to a controlled thermo-mechanical treatment. The experimental results will be interpreted by means of thermodynamically based modelling in order to gain new insights about the underlying physics when designing new materials. Microstructural changes during thermal processing are analysed in detail. It is demonstrated that variables describing the microstructural evolution are directly correlated with mechanical properties such as ultimate tensile strength and impact strength.

Biography

Ernst Gamsjager has completed his PhD in 2002 and worked as a Post Doc with Prof. Militzer at the University of British Columbia, Canada and Prof. Fratzl, Max Planck Institute of Biomaterials, Germany. He obtained the Masing Memorial Award of the German Society of Materials Science in 2007. Since 2010 he works as an associate professor at Montanuniversitat Leoben, Austria. He has published more than 45 papers in reputed journals and is very active in reviewing manuscripts. He is member of the management committee of the Cost action CA15102 "Solutions for critical raw materials under extreme conditions".

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