Multiphase Phenomena and CFD Modeling and Simulation in Materials Processes

Description: This volume contains proceedings dealing with the topics of multiphase phenomena in materials processing and computational fluid dynamics (CFD) modeling and simulation of engineering processes. This collection gathers papers from researchers and engineers involved in the modeling of multiscale and multiphase phenomena in material processing systems. Papers address gas-particle flows, liquid-liquid phase flows, bubbly driven flows, granular flows, liquid-solid flows, multiphase flows in external fields, multiscale heat and mass transfer, and microstructure formation in these multiphase systems. Papers also focus on the CFD modeling and simulation of various engineering processes, such as metal processes including casting, forging, welding, heat treating, and VAR/ESR/PAM/EBM remelting processes; coatings including PVD, CVD, and plasma-assisted EBM-PVD technologies; and other surface engineering processes including induction, laser, and EB thermal processing. The CFD modeling and simulation proceedings discuss applications of CFD to engineering processes and demonstrate how CFD could help scientists and engineers to better understand the fundamentals of engineering processes.

Contents:

Length and Puddle Shape (Suyitno, E.N. Straatsma and L. Katgerman).

MEMS/MICROFLUIDICS.

Design of an Asymmetric Waveform Spectrometer (M.H. Castro-Cedeno).

Design and Simulation of a Piezoresistive MEMS Pressure Sensor for Marine Applications (S. Aravamudhan and S. Bhansali).

Influence of Materials on the Design of Micro Needles (K. Potluri, S. Akella and S. Bhansali).

Transient Analysis of Microchannel Heat Transfer with Volumetric Heat Generation in the Substrate (S.S. Shevade and M.M. Rahman).

Improved MEMS Thermal Actuator Design by Modification of Hot-ArmGeometry (V. Upadhyay, S. Samson, W. Wang and S. Bhansali).

PROCESS MODELING.

Computational Fluid Dynamics: A Tool for the Materials Technology (A. Mukhopadhyay, B. Devulapalli, A. Dutta and E.W. Grald).

Numerical Simulation of Vacuum Dezincing of Lead Alloy (G. Djambazov, C. Bailey, M. Patel and J. Shrimpton).

The Application of CFD to the Design of Electric Furnaces (L.H. Gunnewiek, L. Oshinowo, T. Plikas and R. Haywood).

Simulation of Combustion and Metal Heating in a Mobile Heat TreatmentFurnace (Y. Yang, R.A. de Jong and M.A. Reuter).

Simulation of Bubble Formation Based on the Lattice Boltzmann Method (J. Steiner, C. Redl, W. Brandstätter and A. Triessnig).

CFD Modeling of Sintering Phenomena During Iron Ore Sintering (P. Tan and D. Neuschütz).

Modeling Dissolution in Aluminum Alloys (T. Zoeller, T.H. Sanders, Jr. and G.P. Neitzel).

Computer Simulation of 3D Virtual Reality for Dynamical Modeling and Video Imaging of Nanocomposite (M. Kireitseu, D. Hui, L. Bochkareva, S. Eremeev and I. Nedavniy).

Author Index.

Subject Index.

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