

SOLIDIFICATION

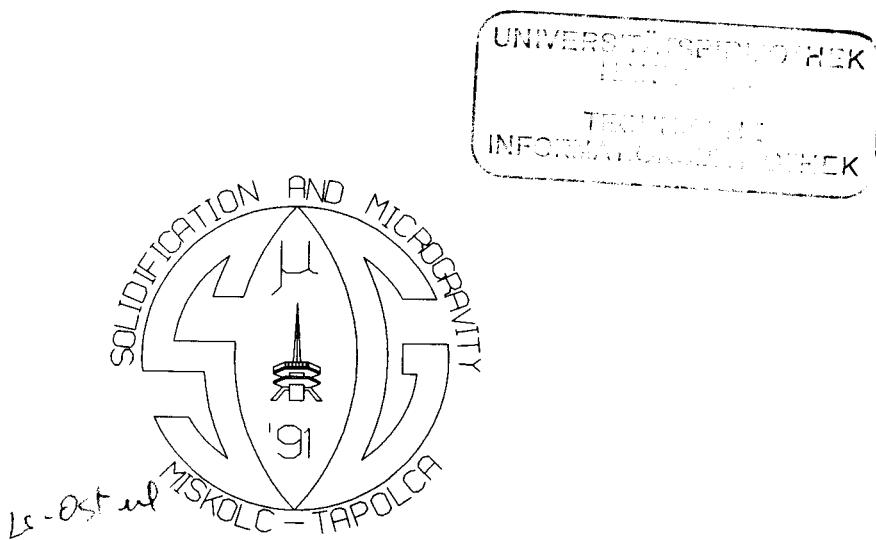
AND

MICROGRAVITY

Editor

P. Bárczy

University of Miskolc, Hungary



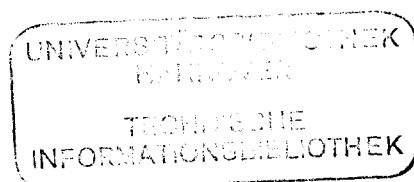
TRANS TECH PUBLICATIONS
Switzerland - Germany - UK - USA

TABLE OF CONTENTS

Introductory Adress		
F. Kovács		1
Prefatory Note		
P. Bárczy		3

I. MICROGRAVITY EXPERIMENTS AND SPACE DEVICES

What to Learn from Solidification Research under Microgravity		
P.R. Sahm and M.H. Keller		5
Particle Engulfment and Pushing by Solidifying Interfaces (PEPSI)		
D.M. Stefanescu, D. Shangguan and P. von den Brincken		25
Effect of Vibration of Crystal during Bridgman Growth under Microgravity Conditions		
G.A. Dolgikh, A.I. Feonychev, N.R. Storozhev and E.V. Zharikov		43
Scientific Basis for the Isothermal Dendritic Growth Experiment: a USMP-2 Space Flight Experiment		
M.E. Glicksman, M.B. Koss, R.C. Hahn, A. Velosa, A. Rojas and E. Winsa		51
Liquid Phase Processing of Oxide Dispersion Strengthened Aluminium Alloys		
L. Froyen, S. De Bondt and A. Deruyttere		61
Coarsening Processes in Liquid Dispersions		
L. Ratke and D. Uffelmann		69
Peculiarities of the Crystal Growth from the Vapour-Gas Phase in Microgravity		
M.B. Shcherbina-Samoilova		85
Structure of Zn-Pb-Fe Alloy Solidified under Microgravity		
Jia Jun, Zhao Jizhou, Chen Yuyong, Li Chengshou, Zhang Jingfang, Chen Xicen, Sh. M. Duguev, T.B. Zhukova and I.A. Smirnov		93
Sol-Gel Processing under Microgravity Conditions		
M. Meier, O. Pamperin, H. Dittus and H.J. Rath		99
Solidification of Refractory Metals in a Free Fall		
V.K. Kutsinskii		107
Horizontal Bridgman Growth of Al-Al₃Ni(Cu) Off-Eutectics		
P. Bárczy and J. Sólyom		113
A Theory of Shapeforming Processes by Directional Solidification under Microgravity Conditions: Part I. Basic Principles. Planar Solid/Liquid Interface		
G. Kaptyay		125
A Theory of Shapeforming Processes by Directional Solidification under Microgravity Conditions. Part II. Melts Covered by Films. Solidification of Al Alloys		
G. Kaptyay and G. Lámer		147
Experiment Facilities for Microgravity Missions		
A. Ecker		159



Universal Multizone Crystallizer - A Precise Device for Space Experiments

P. Bárczy

171

II. SOLIDIFICATION PHENOMENA

Columnar Dendritic Growth: Experiment and Theory

W. Kurz and R.N. Grugel

185

Some Comments on the Present State of Micromodels for Dendritic Solidification

H.E. Exner, M. Rettenmayr and A. Roósz

205

Simulation of the Dendritic Solidification during Single Roller Quenching

L. Gránásy and A. Ludwig

211

Directional Solidification of Al-Cu Alloy

Chen Yuyong, An Geying, Gu Genda and Li Qingchun

219

Growth, Instability and Form of Faceted Crystals and Eutectics

I. Minkoff

227

Crystal-Melt Interfacial Free Energy of Elements and Alloys

L. Gránásy and M. Tegze

243

Surface Tension of Liquid Metals

I. Egry, G. Lohöfer, P. Neuhaus and S. Sauerland

257

The Effect of Processing Conditions on Solidified Structures in Immiscible Systems

J.B. Andrews, R.A. Merrick, Z.B. Dwyer, A.L. Schmale,

C.N. Buckhalt, A.C. Sandlin and M.B. Robinson

269

Dominant Parameters of Separation in Metallic Monotectic Systems

H. Bach, T. Strangfeld, J. Proschmann, U. Kreft,

L. Kemmerling, B. v. Hett and S. Sprenger

283

Solidification Simulation of Castings by the Explicit Finite Element Method

Wang Yi, Zheng Xianshu and Jin Junze

293

Computerized Analysis of the Measurable Processing Variables Influencing the Dimensional Accuracy of Casting during the Crystallization of Cast Iron

L. Vigh, J. Dúl and Zs. Szabó

301

On Surface Properties of Molten Aluminum Alloys of Oxidized Surface

G. Kaptay

315

Author Index

331

Subject Index

333