



Volume 402

15 September 2014

ISSN 0022-0248

**JOURNAL OF** **CRYSTAL**  
**GROWTH**

EDITORS:

T.F. KUECH (Principal Editor),  
University of Wisconsin-Madison

R.S. FEIGELSON, Stanford University

R. KERN, University of Aix-Marseille

K. NAKAJIMA, Kyoto University

G.B. STRINGFELLOW,  
University of Utah

FOUNDING EDITOR: M. SCHIEBER

CO-FOUNDERS: N. CABRERA, B. CHALMERS,  
F.C. FRANK

FORMER ADVISOR: R.A. LAUDISE†

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

**ScienceDirect**



ELSEVIER

---



---

 JOURNAL OF **CRYSTAL GROWTH**


---



---

Abstracted/Indexed in: Aluminium Industry Abstracts; Chemical Abstracts; Current Contents: Physical, Chemical and Earth Sciences; EI Compendex Plus; Engineered Materials Abstracts; Engineering Index; INSPEC; Metals Abstracts. Also covered in the abstract and citation database SCOPUS®. Full text available on ScienceDirect®

## CONTENTS

### Classical semiconductors

Influencing factors on the formation of the low minority carrier lifetime zone at the bottom of seed-assisted cast ingots

G. Zhong, Q. Yu, X. Huang and L. Liu

65

Thermodynamic parameters of CdTe crystals in the cubic phase

D. Freik, T. Parashchuk and B. Volochanska

90

Silicon–hydrogen bond effects on aluminum-induced crystallization of hydrogenated amorphous silicon films

X. Zhai, R. Tan, W. Wang, J. Huang, F. Zhuang, S. Dai and W. Song

99

Heat losses in a CVD reactor for polysilicon production: Comprehensive model and experimental validation

A. Ramos, A. Rodríguez, C. del Cañizo, J. Valdehita, J.C. Zamorano and A. Luque

138

Compositional grading in GaAsSb grown on GaAs substrates

Y.M. Lin, C.H. Chen, J.S. Wu and C.P. Lee

151

Effects of lift-off and strain relaxation on optical properties of InGaN/GaN blue LED grown on 150mm diameter Si (111) substrate

H.F. Liu, H.L. Seng, J.H. Teng, S.J. Chua and D.Z. Chi

155

Defect analysis in AlGaIn layers on AlN templates obtained by epitaxial lateral overgrowth

A. Mogilatenko, V. Küller, A. Knauer, J. Jeschke, U. Zeimer, M. Weyers and G. Tränkle

222

High-quality MOVPE butt-joint integration of InP/AlGaInAs/InGaAsP-based all-active optical components

I.V. Kulkova, S. Kadkhodazadeh, N. Kuznetsova, A. Huck, E.S. Semenova and K. Yvind

243

Deflection of threading dislocations in patterned 4H–SiC epitaxial growth

H. Tsuchida, R. Takanashi, I. Kamata, N. Hoshino, E. Makino and J. Kojima

260

Etching effect of tertiary-butyl chloride during InP-nanowire growth

K. Tateno, G. Zhang and H. Gotoh

299

Influence of hydrogen and TMIn on indium incorporation in MOVPE growth of InGaIn layers

R. Czernecki, S. Kret, P. Kempisty, E. Grzanka, J. Plesiewicz, G. Targowski, S. Grzanka, M. Bilska, J. Smalc-Koziorowska, S. Krukowski, T. Suski, P. Perlin and M. Leszczynski

330

### Electronic materials

Migration of Te inclusions in CdZnTe single crystals under the temperature gradient annealing

Y. He, W. Jie, T. Wang, Y. Xu, Y. Zhou, Y. Zaman and G. Zha

15

Enhancement of Be and Mg incorporation in wurtzite quaternary BeMgZnO alloys with up to 5.1eV optical bandgap

M. Toporkov, V. Avrutin, S. Okur, N. Izyumskaya, D. Demchenko, J. Volk, D.J. Smith, H. Morkoç and Ü. Özgür

60

Growth of Cu<sub>2</sub>ZnSnS<sub>4</sub> crystals by the directional freezing method with an induction heater

D.-L. Mai, H.-J. Park and I.-H. Choi

104

Crystallographic phase separation and band gap of ZnO<sub>1-x</sub>S<sub>x</sub> (x=0.1–0.3) alloy thin films grown by pulsed laser deposition

K. Dileep, R. Sahu, K.K. Nagaraja and R. Datta

124

Annealing effects on the composition and disorder of Ga(N,As,P) quantum wells on silicon substrates for laser application

S. Gies, M. Zimprich, T. Wegele, C. Kruska, A. Beyer, W. Stolz, K. Volz and W. Heimbrodt

169

Texture and morphology of ZnO grown on nanocrystalline *p*-sexiphenyl thin films

S. Blumstengel, H. Kirmse, M. Sparenberg, S. Sadofev, F. Polzer and F. Henneberger

187

Improvements in epitaxial lateral overgrowth of InP by MOVPE

N.H. Julian, P.A. Mages, C. Zhang and J.E. Bowers

234

Effect of Ga deposition rates on GaSb nanostructures grown by droplet epitaxy

M. Kunruga, S. Kiravittaya, S. Panyakeow and S. Ratanathammaphan

285

Vertical Bridgman growth of thermoelectric clathrate Ba<sub>8</sub>Ga<sub>16</sub>Sn<sub>30</sub> with a type-VIII structure

Y.X. Chen, K. Niitani, J. Izumi, K. Suekuni and T. Takabatake

312

### Solution growth; industrial biological and molecular crystallization

In-situ observation of isothermal CaSiO<sub>3</sub> crystallization in CaO–Al<sub>2</sub>O<sub>3</sub>–SiO<sub>2</sub> melts: A study of the effects of temperature and composition

J.-J. Liu, G. Chen, P.-C. Yan, B. Planpain, N. Moelans and M. Guo

1

*Contents continued on inside back cover*



Synthesis, growth and characterization of new organic crystal: 2-Aminopyridinium p-Toluenesulfonate for third order nonlinear optical applications I.P. Bincy and R. Gopalakrishnan		
Effect of microwave radiation on diffusion behavior of anti-solvent during crystallization Y. Asakuma and M. Miura		
Rapid growth and optical studies of KDP crystals with organic additives S. Zhu, S. Wang, J. Ding, G. Liu, D. Wang, L. Liu, W. Li, P. Huang, Q. Gu and X. Xu		
Synthesis of zinc pyrovanadate 3D flower-like microspheres and their photocatalytic properties M. Ren, J. Song, Y. Shi, Y. Xiang and G. Hu		
Synthesis, crystal growth and characterization of a D- $\pi$ -A type novel organic nonlinear optical single crystal A. Praveen Menezes, A. Jayarama and S. Weng Ng		
Thermoluminescence behavior of $KCl_xBr_{1-x}$ : In mixed crystals exposed to gamma radiation Kh. Rezaee Ebrahim Sarae, S.A. Hosseini, H. Faripour, M.R. Faiez, M.R. Abdi, N. Soltani and A. Aghay Khareiky		
Modeling and simulation of a novel susceptor composed of two materials in MOVPE reactor Z. Li, J. Zhang, J. Li, H. Jiang, X. Fu, Y. Han, Y. Xia, Y. Huang, J. Yin, L. Zhang and Y. Hao		
Cooperative effects of polarization and polyaspartic acid on formation of calcium carbonate films with a multiple phase structure on oriented calcite substrates N. Wada, N. Horiuchi, M. Nakamura, K. Nozaki, T. Hiyama, A. Nagai and K. Yamashita		
On the elementary processes of protein crystallization: Bond selection mechanism C.N. Nanev		
Onset of the initial instability during the solidification of welding pool of aluminum alloy under transient conditions W. Zheng, Z. Dong, Y. Wei and K. Song		
Investigation of growth rate dispersion in lactose crystallisation by AFM T.D. Dincer, M.I. Ogden and G.M. Parkinson		
Morphology study of methane-propane clathrate hydrates on the bubble surface in the presence of SDS or PVCap S.Y. Lee, H.C. Kim and J.D. Lee		
A model for determination of the interfacial energy from the measured metastable zone width by the polythermal method L.-D. Shiau and T.-S. Lu		
<b>General subjects</b>		
Thermal properties and optimization of process parameters for the growth of silver thiogallate crystal by differential scanning calorimetry Z. He, B. Zhao, S. Zhu, B. Chen and W. Huang		
Nanoharvesting of GaN nanowires on Si (211) substrates by plasma-assisted molecular beam epitaxy M. Agrawal, A. Jain, D.V. Sridhara Rao, A. Pandey, A. Goyal, A. Kumar, S. Lamba, B.R. Mehta, K. Muraleedharan and R. Muralidharan		
Magnetic behavior of as-deposited and annealed CoFe and CoFeCu nanowire arrays by ac-pulse electrodeposition A. Ramazani, M. Almasi-Kashi, E. Golafshan and M. Arefpour		
Crystal growth and terahertz wave generation of organic NLO crystals: OH1 Y. Li, Z. Wu, X. Zhang, L. Wang, J. Zhang and Y. Wu	22	53
Numerical simulations of SiGe crystal growth by the traveling liquidus-zone method in a microgravity environment K. Abe, S. Sumioka, K.-I. Sugioka, M. Kubo, T. Tsukada, K. Kinoshita, Y. Arai and Y. Inatomi	32	71
Ultrasonically triggered freezing of aqueous solutions: Influence of initial oxygen content on ice crystals' size distribution A. Jabbari-Hichri, R. Peczkalski and P. Laurent	48	78
Development of the vertical Bridgman technique for 6-inch diameter <i>c</i> -axis sapphire growth supported by numerical simulation C. Miyagawa, T. Kobayashi, T. Taishi and K. Hoshikawa	119	83
Czochralski growth of $Gd_7Ti_3O_{17}$ single crystals F.Y. Guo, W.H. Zhang, M. Ruan, J.B. Kang and J.Z. Chen	130	94
Optical floating zone method growth and optical properties of corundum $Mg_4Nb_3O_9$ single crystal L. Li, D. Duan, Q. Zhou, D. Xu, T. Cui, B. Liu and H. Yuan	161	109
Morphological instability of a stressed solid cylinder in the solidification and melting regimes J. Colin	175	113
A new approach to grow the Heusler Ni-Mn-Sn unidirectional crystal J. Yu, J. Ren, H. Li, J. Fu, Q. Zhai, Z. Luo and H. Zheng	179	147
Anomalous overgrowth of converging dendrites during directional solidification H. Yu, J. Li, X. Lin, L. Wang and W. Huang	195	210
Influence on the macrosegregation of binary metallic alloys by thermoelectromagnetic convection and electromagnetic stirring combination I. Kaldre, Y. Fautrelle, J. Etay, A. Bojarevics and L. Buligins	203	230
Thermal and microstructure simulation of thermoelectric material $Bi_2Te_3$ grown by zone-melting technique Y.-R. Chen, W.-S. Hwang, H.-L. Hsieh, J.-Y. Huang, T.-K. Huang and J.-D. Hwang	215	273
Synthesis, floating zone crystal growth and characterization of the quantum spin ice $Pr_2Zr_2O_7$ pyrochlore S.M. Koohpayeh, J.-J. Wen, B.A. Trump, C.L. Broholm and T.M. McQueen	249	291
Growth of single crystalline delafossite $LaCuO_2$ by the travelling-solvent floating zone method A. Mohan, B. Büchner, S. Wurmehl and C. Hess	267	304
Crystal growth of hexagonal boron nitride (hBN) from Mg-B-N solvent system under high pressure N.D. Zhigadlo		308
Effect of a transverse magnetic field on solidification structure in directionally solidified Sn-Pb hypoeutectic alloys D. Du, Z. Lu, A. Gagnoud, Y. Fautrelle, Z. Ren, X. Lu, R. Moreau and X. Li	9	319
Growth and characterization of $\beta$ - $LiGaO_3$ single crystal C. Chen, C.-A. Li, S.-H. Yu and M.M.C. Chou		325
Large single crystal growth and characterization of CuX (X=Cl, Br) by temperature reduction method Y. Lv, Z. Xu, L. Ye, G. Su and X. Zhuang	37	337
Corrigendum to "Inhibition of Te surfactant effect on surface morphology of heavily Te-doped GaAs" [J. Cryst. Growth 383C (2013) 30-35] B. Paquette, B. Ilahi, V. Aimez and R. Arès	42	342