

第 52 卷 第 5 期 2023 年 5 月

目 次

“半导体薄膜与外延技术”专题

功率半导体薄膜

Si 衬底上外延生长 GaN 基射频电子材料的研究进展(综合评述) 杨学林, 沈波(723)

金刚石肖特基二极管的研究进展(综合评述) 彭博, 李奇, 张舒森, 樊叔维, 王若铮, 王宏兴(732)

基于复合势垒的 AlGaIn/GaN 异质结材料的制备与性能研究

..... 彭大青, 李忠辉, 蔡利康, 李传皓, 杨乾坤, 张东国, 罗伟科(746)

利用干燥空气改善熔融 KOH 对单晶碳化硅的腐蚀 孙帅, 宋华平, 杨军伟, 王文军, 屈红霞, 简基康(753)

基于聚氨酯垫的 4H-SiC 单晶衬底研磨性质研究 吴锐文, 宋华平, 杨军伟, 屈红霞, 赖晓芳(759)

光电子薄膜

用于单片集成的硅基外延 III-V 族量子阱和量子点激光器研究(综合评述)

... 王俊, 葛庆, 刘帅呈, 马博杰, 刘俾良, 翟浩, 林枫, 江晨, 刘昊, 刘凯, 杨一粟, 王琦, 黄永清, 任晓敏(766)

分子束外延高 Al 组分 AlGaIn 薄膜及 Si 掺杂研究

..... 梁潇, 李思琦, 王中伟, 邵鹏飞, 陈松林, 陶涛, 谢自力, 刘斌, 陈敦军, 郑有焘, 张荣, 王科(783)

MOCVD 外延生长 InN 薄膜及其光学性质研究 殷鑫燕, 陈鹏, 梁子彤, 赵红(791)

反应磁控溅射制备 h-BN 薄膜及其日盲紫外探测器 武成, 朱昭捷, 李坚富, 涂朝阳, 吕佩文, 王燕(798)

高成品率和平整度的 GaN 基 Micro LED 芯片激光剥离工艺的研究 岳龙, 徐俞, 王建峰, 徐科(805)

Micro-LED 的侧壁损伤以及光学特性 蔡鑫, 徐俞, 曹冰, 徐科(812)

高功率多结 905 nm 垂直腔面发射激光器 赵飞云, 任翱博, 巫江(818)

新型薄膜材料

六方氮化硼外延生长研究进展(综合评述) 王高凯, 张兴旺(825)

退火方式及温度对层层碘化法 CuI 薄膜结构、形貌和光电性能的影响 耿方娟, 杨磊, 朱嘉琦(842)

Er 掺杂 WS₂ 的制备及光电特性研究 曹晟, 张锋, 刘绍祥, 陈思凯, 赵杨, 石轩, 赵洪泉(849)

先进外延及相关技术

单晶金刚石异质外延用铌复合衬底研究现状(综合评述)

..... 屈鹏霏, 金鹏, 周广迪, 王镇, 许敦洲, 吴巨, 郑红军, 王占国(857)

金属调制分子束外延生长氮化铝薄膜

..... 刘欢,邵鹏飞,陈松林,周辉,李思琦,陶涛,谢自力,刘斌,陈敦军,郑有焘,张荣,王科(878)

单层 α - MoO_3 半导体薄膜的范德瓦耳斯外延制备 韩钰,牛群,周琴,赵爱迪(886)

石墨烯上异质远程外延 GaN 的研究 徐建喜,王钰宁,徐俞,王建峰,徐科(894)

多晶金刚石衬底范德瓦耳斯外延 GaN 薄膜

..... 白玲,宁静,张进成,王东,王博宇,武海迪,赵江林,陶然,李忠辉(901)

枝晶 WS_2 /单层 WS_2 薄膜的 CVD 可控制备与表征 张鑫,沈俊,湛立,崔恒清,葛炳辉,武传强(909)

高速旋转垂直热壁 CVD 外延生长 n 型 4H-SiC 膜的研究 韩跃斌,蒲勇,施建新,闫鸿磊(918)

· 简 讯 ·

济南大学刘宏团队在 8 英寸 X 轴铌酸锂晶体制备技术领域取得新突破 (925)

· 企业介绍 ·

北京博宇半导体工艺技术有限公司 (926)

费勉仪器科技(上海)有限公司 (927)

Dr. Eberl MBE-Komponenten GmbH 公司 (928)

香港协和国际贸易服务公司 (929)

中国科学院沈阳科学仪器股份有限公司 (930)

JOURNAL OF SYNTHETIC CRYSTALS

Vol. 52, No. 5 May 2023 (Series No. 295)

CONTENTS

• Semiconductor Thin Films and Epitaxial Techniques •

Semiconductor Thin Films for Power Devices

Epitaxial Growth of GaN Based RF Electronic Materials on Si Substrates (Review)

..... YANG Xuelin, SHEN Bo(723)

Research Progress of Diamond Schottky Barrier Diodes (Review)

..... PENG Bo, LI Qi, ZHANG Shumiao, FAN Shuwei, WANG Ruozheng, WANG Hongxing(732)

Growth and Properties of AlGaIn/GaN Heterojunction Material with Coupled Barrier

..... PENG Daqing, LI Zhonghui, CAI Likang, LI Chuanhao, YANG Qiankun, ZHANG Dongguo, LUO Weike(746)

Optimization of KOH Etching for Single Crystal SiC by Dry Air

..... SUN Shuai, SONG Huaping, YANG Junwei, WANG Wenjun, QU Hongxia, JIAN Jikang(753)

Grinding Properties of 4H-SiC Single Crystal Substrate Using Polyurethane Pad

..... WU Ruiwen, SONG Huaping, YANG Junwei, QU Hongxia, LAI Xiaofang(759)

Optoelectronic Thin Films

Investigation of Epitaxial III-V Quantum Well and Quantum Dot Lasers on Silicon for Monolithic Integration (Review)

..... WANG Jun, GE Qing, LIU Shuaicheng,

MA Bojie, LIU Zhuoliang, ZHAI Hao, LIN Feng, JIANG Chen, LIU Hao, LIU Kai, YANG Yisu, WANG Qi, HUANG Yongqing, REN Xiaomin(766)

Study on Molecular Beam Epitaxy of High Al Content AlGaIn Thin Films and Si Doping

..... LIANG Xiao, LI Siqu,

WANG Zhongwei, SHAO Pengfei, CHEN Songlin, TAO Tao, XIE Zili, LIU Bin, CHEN Dunjun, ZHENG Youdou, ZHANG Rong, WANG Ke(783)

Epitaxial Growth and Optical Properties of InN film by MOCVD

..... YIN Xinyan, CHEN Peng, LIANG Zitong, ZHAO Hong(791)

Fabrication of h-BN Films by Reactive Sputtering Method for Solar-Blind Ultraviolet Detectors

..... WU Cheng, ZHU Zhaojie, LI Jianfu, TU Chaoyang, LYU Peiwen, WANG Yan(798)

Laser Lift-Off Process of GaN-Based Micro LED Chip with High Yield and Flatness

..... YUE Long, XU Yu, WANG Jianfeng, XU Ke(805)

Sidewall Damage and Optical Properties of Micro-LED CAI Xin, XU Yu, CAO Bing, XU Ke(812)

High-Power Multi-Junction 905 nm Vertical-Cavity Surface-Emitting Lasers ZHAO Feiyun, REN Aobo, WU Jiang(818)

Novel Thin Film Materials

Research Progress of Epitaxial Growth of Hexagonal Boron Nitride (Review) WANG Gaokai, ZHANG Xingwang(825)

Effect of Annealing Method and Temperature on Structure, Morphology and Photoelectric Properties of CuI Thin Films by Layer by Layer Iodization *GENG Fangjuan, YANG Lei, ZHU Jiaqi*(842)

Preparation and Photoelectric Properties of Er-Doped WS₂

..... *CAO Sheng, ZHANG Feng, LIU Shaoxiang, CHEN Sikai, ZHAO Yang, SHI Xuan, ZHAO Hongquan*(849)

Advanced Epitaxy and Related Techniques

Research Status of Iridium-Based Composite Substrates for Heteroepitaxy of Single Crystal Diamond (Review)

..... *QU Pengfei, JIN Peng, ZHOU Guangdi, WANG Zhen, XU Dunzhou, WU Ju, ZHENG Hongjun, WANG Zhanguo*(857)

AlN Films Fabricated by Molecular Beam Epitaxy with Metal Modulation *LIU Huan,*

SHAO Pengfei, CHEN Songlin, ZHOU Hui, LI Siqi, TAO Tao, XIE Zili, LIU Bin, CHEN Dunjun, ZHENG Youdou, ZHANG Rong, WANG Ke(878)

Van der Waals Epitaxial Preparation of Single-Layer α -MoO₃ Semiconductor Thin Films

..... *HAN Yu, NIU Qun, ZHOU Qin, ZHAO Aidi*(886)

Mechanism of Remote Heteroepitaxial GaN Growth on Graphene

..... *XU Jianxi, WANG Yuning, XU Yu, WANG Jianfeng, XU Ke*(894)

Van der Waals Epitaxial GaN Thin Films on Polycrystalline Diamond Substrate

..... *BAI Ling, NING Jing, ZHANG Jincheng, WANG Dong, WANG Boyu, WU Haidi, ZHAO Jianglin, TAO Ran, LI Zhonghui*(901)

Controllable Preparation and Characterization of Dendritic WS₂/Monolayer WS₂ Grown by CVD

..... *ZHANG Xin, SHEN Jun, ZHAN Li, CUI Hengqing, GE Binghui, WU Chuanqiang*(909)

Epitaxial Growth Study of n-Type 4H-SiC Films by High-Speed Wafer Rotation Vertical Hot-Wall CVD Equipment

..... *HAN Yuebin, PU Yong, SHI Jianxin, YAN Honglei*(918)