

マテリアル先端リサーチインフラ利用報告書

ARIM User's Report

[Release : 2024.07.25] [Update : 2024.03.28]

課題データ / Project Data

課題番号 Project Issue Number	23NM5426
利用課題名 Title	Synthesis and Integration of 2D materials for high-performance
利用した実施機関 Support Institute	物質・材料研究機構 / NIMS
機関外・機関内の利用 External or Internal Use	内部利用 (ARIM事業参画者以外) / Internal Use (by non ARIM members)
ARIM半導体基盤PF 関連課題 Related to ARIM-SETI	指定なし / No Designation
横断技術領域 Cross-Technology Area	加工・デバイスプロセス/Nanofabrication
重要技術領域 Important Technology Area	量子・電子制御により革新的な機能を発現するマテリアル/Materials using quantum and electronic control to perform innovative functions
キーワード Keywords	Transistors, Chemical Vapor Deposition (CVD), 1D Nanoribbons, 2D Materials

利用者と利用形態 / User and Support Type

利用者名 (課題申請者) User Name (Project Applicant)	Shisheng LI
所属名 Affiliation	物質・材料研究機構
共同利用者氏名 Names of Collaborators Excluding Supporters in the Hub and Spoke Institutes	
ARIM実施機関支援担当者 Names of Supporters in the Hub and Spoke Institutes	
利用形態 Support Type	機器利用/Equipment Utilization

利用した主な設備 / Equipment Used in This Project

利用した主な設備 Equipment ID & Name	NM-605 : 水蒸気プラズマ洗浄装置 [AQ-500 #1] NM-606 : UVオゾンクリーナー [UV-1] NM-612 : SiNプラズマCVD装置 [PD-220NL] NM-649 : FE-SEM+EDX [SU8230]
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報告書データ / Report

概要（目的・用途・実施内容） Abstract (Aim, Use Applications and Contents)	The AFM and SEM are high-efficiency tools for studying the morphology of CVD-grown materials including the information on thickness, length, width, etc.
実験 Experimental	AFM tapping mode and SEM were employed to study the morphology of as-grown 1D MoS ₂ nanoribbons grown on mechanically exfoliated h-BN flakes.
結果と考察 Results and Discussion	AFM images of the as-grown 1D MoS ₂ nanoribbons have sharp and straight edges. The thickness of the MoS ₂ nanoribbon is ~0.7 nm, indicating a monolayer thickness. Since the Jupiter XR AFM can achieve the atomic resolution. It is promising to study the epitaxy relationship between the top MoS ₂ nanoribbon and bottom h-BN flakes in the future. SEM images show morphology at a large scope which can easily tell the length of the as-grown 1D MoS ₂ nanoribbons and how the width evolves during the growth process. Because of the precipitation of MoS ₂ from the Na-Mo-O-S droplets, the width of 1D MoS ₂ nanoribbons shrinks gradually.
図・表・数式 Figures, Tables and Equations	
その他・特記事項（参考文献・謝辞等） Remarks(References and Acknowledgements)	

成果発表・成果利用 / Publication and Patents

DOI（論文・プロシーディング） DOI (Publication and Proceedings)	
口頭発表、ポスター発表 および、その他の論文 Oral Presentations etc.	
特許出願件数 Number of Patent Applications	0件
特許登録件数 Number of Registered Patents	0件