

国際研究A(2022年度)

「High electric performance non-degenerated Zn_3N_2 thin films」

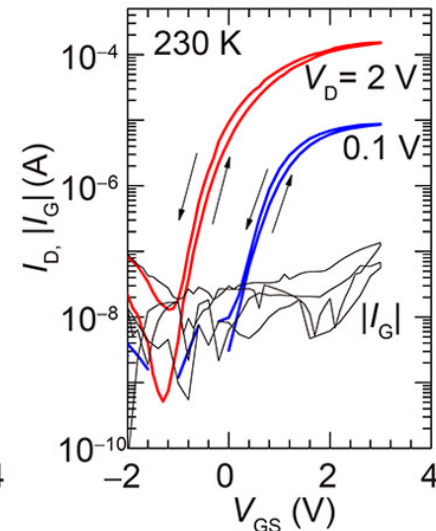
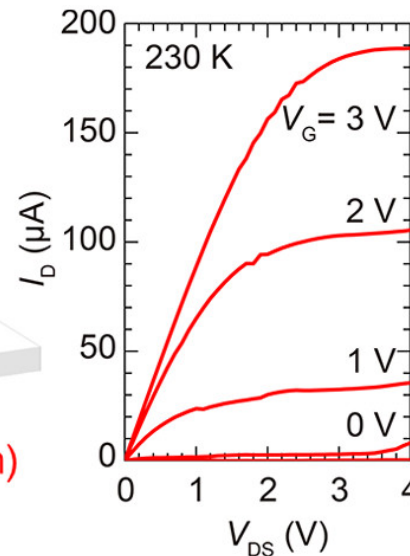
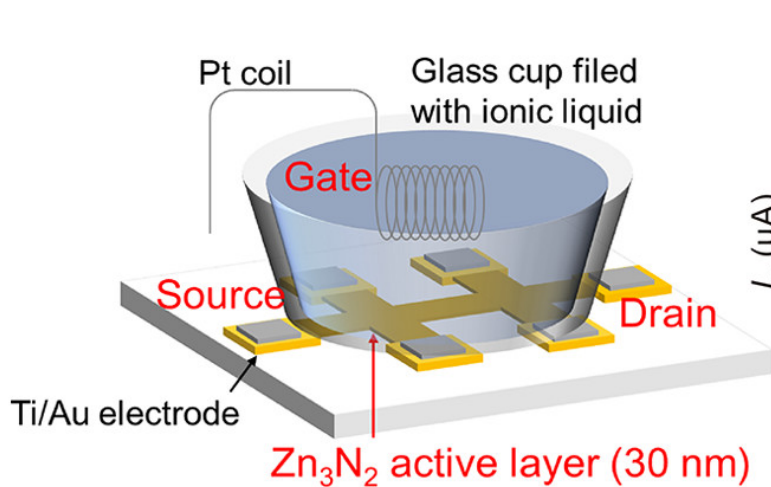
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— 研究目的 —

Zn_3N_2 semiconductor shows high electron mobility even fabricated at low temperature, although it is composed of only non-toxic and earth-abundant elements. Therefore, it may have potential for flexible applications such as sensors and thin-film transistors. However, this material tends to be degenerated-states due to the high residual electron density caused by unintentional impurity doping. Especially, carrier transport properties of non-degenerated Zn_3N_2 films appropriate for thin-film transistors applications are yet to be further investigated. In this study, we will investigate optical and electronic properties including carrier scattering mechanism in non-degenerated polycrystalline Zn_3N_2 films. Further, we will demonstrate transistor to see the potential of the present non-degenerated polycrystalline Zn_3N_2 thin films as active layers.

— 研究成果・効果 —



発表論文・関連論文：

Kaiwen Li, Atsushi Shimizu, Xinyi He, Keisuke Ide*, Kota Hanzawa, Kosuke Matsuzaki, Takayoshi Katase, Hidenori Hiramatsu, Hideo Hosono, Qun Zhang*, and Toshio Kamiya; Low Residual Carrier Density and High In-Grain Mobility in Polycrystalline Zn_3N_2 Films on a Glass Substrate. ACS Applied Electronic Materials, 2022, 4.4: 2026-2031.