

Abstract Submitted
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Magnetic Molecules on GaN: A Low Temperature STM Investigation¹ KENDAL CLARK, D. ACHARYA, V. IANCU, E. LU, A. SMITH, S.-W. HLA, Ohio University — Spin electron interactions involving magnetic molecules on semiconductor surfaces are of great interest for the development of molecular spintronic devices. Here, we studied structural and electronic properties of TBrPP-Co molecules deposited on a freshly grown nitrogen polar GaN (0001(bar)) surface using a scanning tunneling microscopy and spectroscopy at 4.6 K under ultra-high-vacuum conditions. On GaN (0001(bar)), the molecules bind to the surface via two molecular conformations: saddle and planar. STM images show self-assembled clusters of molecules on GaN (0001(bar)) surface. Within the self-assembled molecular clusters, the molecules are aligned either parallel or 90 degree rotated to each other. Scanning tunneling spectroscopy clearly reveals the HOMO and LUMO gap of the molecule within the bandgap of the GaN semiconductor. Molecular charge transfer is taking place within the system, shown by the shifting of the HOMO level of the molecule 0.4eV towards the valence band of the semiconductor. This work leads the way for future work of spin active molecules on semiconductor surfaces..

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