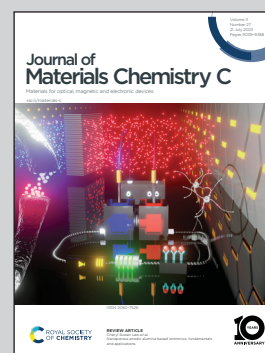


Showcasing research from Jiangxi University of Science and Technology and Jiangxi University of Chinese Medicine, China.

Theoretical insight into the intrinsic electronic transport properties of graphene-biphenylene-graphene nanosheets and nanoribbons: a first-principles study

Inspired by the successful synthesis of biphenyl networks, graphene-biphenyl-graphene (G-BPN-G) heterojunctions were constructed and systematically studied, showing that the  $I$ - $V$  curves of two-dimensional (2D) and quasi-one-dimensional (Q1D) G-BPN-G devices exhibit intrinsic negative differential resistance (NDR) characteristics regardless of the electronic transport directions. Adjustable metal to semiconductor devices can be achieved by varying the combination of H and O passivated cells in Q1D G-BPN-G nanoribbon-based nanodevices. These novel G-BPN-G devices have promising practical applications in the future of electronic nanodevices.

### As featured in:



See Tong Chen, Xianbo Xiao *et al.*,  
*J. Mater. Chem. C*, 2023, **11**, 9114.