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**Boron nitride nanoribbons become metallic** ALEJANDRO LOPEZ-BEZANILLA, JINGSONG HUANG, HUMBERTO TERRONES, BOBBY SUMPTER, Oak Ridge National Laboratory — Boron nitride (BN) sheets can be grown on nickel substrates, similar to graphene, and BN domains coexist with graphene. The synthesis of zig-zag BN nanoribbons (zBNNRs) brings interesting possibilities regarding edge chemistry: since both boron and nitrogen atoms are exposed on each edge the functionality of the nanostructure is enriched. We report first principles calculations on the electronic properties of zBNNR nanoribbons with several types of functionalization. Sulfur and oxygen edge doping and topological one-dimensional defects are studied and the possibility of having half metallicity is also analysed. Sulfur and oxygen edge passivation converts zBNNRs into a metallic material which offers several possibilities for new applications in electronics, molecular sensing and spintronics.

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