On-surface synthesis with atomic hydrogen

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On-surface reactions on the crystal surfaces provide methods for the production of atomically defined molecular nanostructures, which allows for the very precise determination of their physical and chemical properties. Due to the possibilities offered by on-surface synthesis, new methods of producing molecular nanostructures are constantly being sought.

Here we demonstrate a method, where source of atomic hydrogen is used to tune the on-surface reaction of the synthesis of nanographene. By using atomic hydrogen it is possible to: clean the surface from the reaction by-products[1], remove organometallic states[2] or substitute heteroatoms inside the nanographene's with atomic hydrogen[1].

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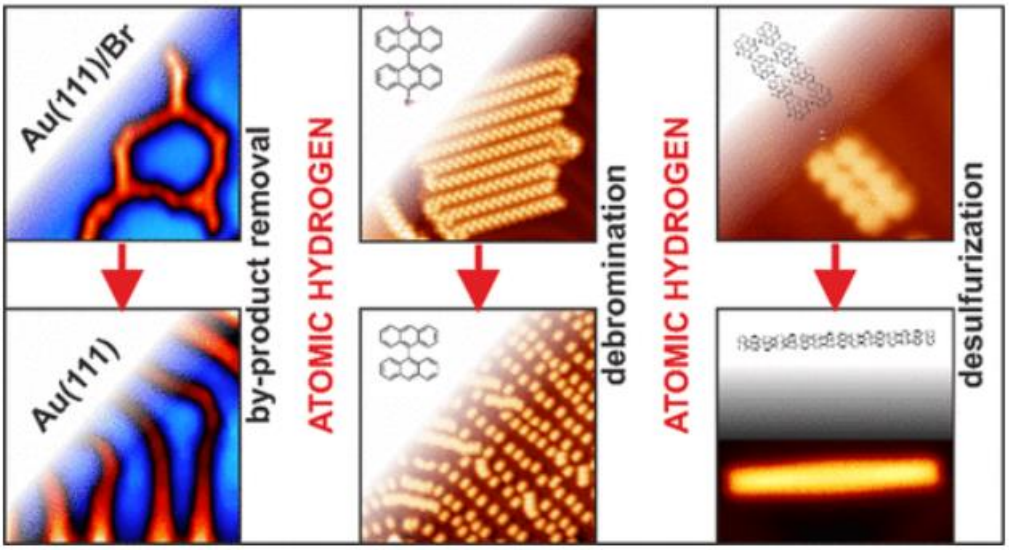

Fig. 1. Atomic hydrogen as a tool in on-surface synthesis of nanographene

[1] R. Zuzak et al., On-Surface Synthesis with Atomic Hydrogen, ACS Nano, 14, 10, 13316–13323 (2020)

[2] R. Zuzak et al., On-Surface Synthesis of Chlorinated Narrow Graphene Nanoribbon Organometallic Hybrids, . Phys. Chem. Lett. , 11, 24, 10290–10297 (2020)