Preparation of carbon nanotube Y-junctions from graphene nanoribbons

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Abstract
The mass production of fullerenes and nanotubes faces the problem of their selective production. Special kind of graphene patterns was presented earlier which can be used as initial structures for fullerenes, nanotubes and other carbon nanostructures. Quantum chemical molecular dynamics calculations have proved that these structures transform in a self-organizing way into the desired structures [1-2]. In this work the conditions and the process of graphene based self-organizing transformation for carbon nanotube Y-junctions were studied. Our results can initiate new experimental researches for improving the existing carbon nanostructure productions and to develop a new, structure-selective nanolithography of carbon nanotube Y-junction.

References

[1] I. Laszlo and I. Zsoldos, EPL, 99 (2012) 63001
[2] I. Laszlo and I. Zsoldos, Phys. Status Solidi B 249, No. 12, (2012) 2616–2619

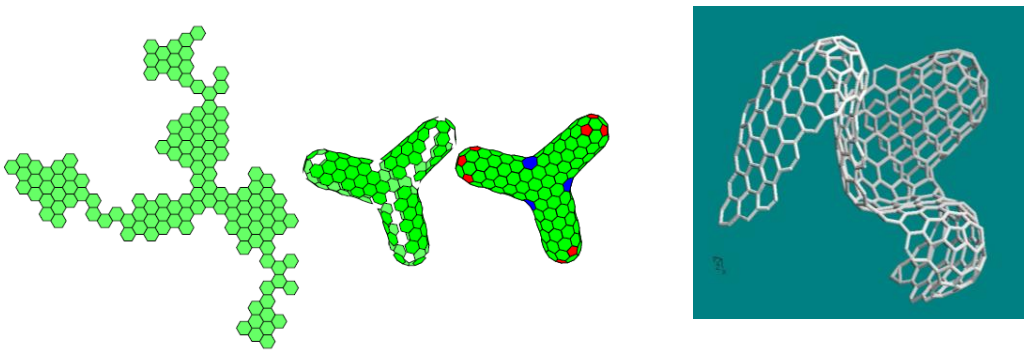

Figure 1: The self-organizing way does not result in a Y-junction when only one graphene pattern (left side) is used as an initial structure and the structure develops wrong (right side).

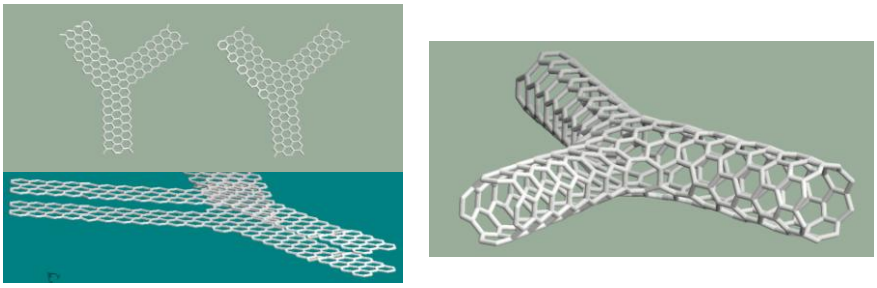

Figure 2: The Y-junction can develop perfect (right side) when two graphene patterns are used as initial structures which are placed below each other appropriately (left side)