Women in Science – 3rd Erlangen Symposium

Crafting nanographenes and nonconventional carbon nanostructures with an aryne-based "molecular Lego"

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The discovery of graphene and other carbon-based materials opened a new era in materials science, wherein synthetic organic chemistry is called to play an important role. In particular, the tailored, bottom-up synthesis of nanosized graphene substructures (nanographenes) and other polycyclic conjugated hydrocarbons (PCHs) with customized shapes and electronic properties, is a very active area of research. Within this realm, aryne intermediates stand out as ideal synthetic building blocks, providing privileged strategies for the convergent construction of polycyclic compounds containing aromatic rings.[1,2]

In this lecture, some recent contributions from our group to this field will be presented, with particular emphasis on the use of polycyclic arynes and bisaryne precursors for the straightforward access to extended and/or structurally complex aromatic architectures. Our efforts towards the synthesis of singular aromatics and relevant π-functional materials, such as acenes, cycloarenes, porous nanographenes or novel fullerene derivatives will be showcased, including selected examples resulting from the successful combination of solution-phase chemistry based on aryne cycloaddition reactions, with the on-surface transformation of the thus-prepared polycyclic precursors.

During my presentation, I will aim to contextualize my aforementioned current research work within the broader framework of my scientific and academic trajectory. This will include not only my scientific training and research path, but also my role as a founder and co-director of CiQUS, a young research center which over the span of just 12 years, has evolved into one of the leading European university institutes working at the interdisciplinary intersection of chemistry, biology, and materials science.

References

[1] F. García, D. Peña, D. Pérez, E. Guitián, in *Modern Aryne Chemistry*, Wiley-VCH, 27-68 (2021).
[2] I. Pozo, E. Guitián, D. Pérez, D. Peña, *Acc. Chem. Res*., **2019**, *52*, 2472-2481.